

⑥

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 FIA 1,7 f

1. Edition

En

VE 6/10 F 2000 R 44
0 460 406 008

Overflow temperature 45° C

supersedes
company:
engine:

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Fiat
8160.61

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers
0,3

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/..

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1800	5,2 - 5,6 mm		
1.2 Supply-pump pressure	1800	7,0 - 7,6 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	1800	39,0 - 40,0 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery without charge-air pressure	--	-- cm ³ /1000 strokes		
1.4 Idle regulation	400	8,0 - 12,0 cm ³ /1000 strokes		2,5(3,0)
1.5 Full-speed regulation	100	min. 58,0 cm ³ /1000 strokes		
1.6 Start	2200	17,0 - 23,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing	1800	--		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min	1000	1800	2000
	mm	1,7-2,5(1,4-2,8)	(4,7-6,1)	5,8-6,6(5,5-6,9)
2.2 Supply pump	n = rev/min	400		2000
	bar (kgf/cm ²)	2,2-2,8		7,6-8,2
Overflow delivery	n = rev/min	500		2000
	cm ³ /10 s	55-110(40-125)		55-110(40-125)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2300 2200 2000 1800 1200 600	2,0 - 6,0 (16,0-24,0) 37,5 - 39,5 (36,2-40,8) (37,2-41,8) 42,0 - 44,4 (40,9-45,5) 31,5-34,5 (30,0-36,0)	
switch-off	2000	0	
Idle stop	500 400	max. 4,0 (6,0 - 14,0)	
2.4 Solenoid	cut-in voltage	min. 10 V	
		rated voltage 12V	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	--
KF	5,9-6,1
MS	1,7-1,9
SVS	max. 6,0
* FH	1,8-2,4
Ax K	
Bx L	

Observations

* operating stroke
(cold-start accel.)

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5.82

Test Specifications

Distributor-type

Fuel-injection Pumps

En

VE 3/10 F 2100 R 46
0 460 403 003

Overflow temperature 45° C

supersedes
company:
engine:

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Fiat
8130.61.200

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting 0,3 mm ± 0,02(0,04)

see VDT-W-460/.

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	4,0-4,4 mm		
1.2 Supply-pump pressure	1500	5,4-6,0 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	1500	39,5-40,5 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery without charge-air pressure	--	-- cm ³ /1000 strokes		
1.4 Idle regulation	350	8,0-12,0 cm ³ /1000 strokes		2,5(3,0)
1.5 Full-speed regulation	100	min.40,0 cm ³ /1000 strokes		
1.6 Start	2350	7,0-13,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing	1500	--		

2. Test Specifications		checking values in brackets ()			
2.1 Timing device	n = rev/min mm	1000 1,7-2,5(1,4-2,8)	1500 (3,5-4,9)	1800 5,0-5,6(4,6-6,0)	2100 6,1-6,9(5,8-7,2)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	600 2,3 - 2,9			2100 7,5-8,1
Overflow delivery	n = rev/min cm ³ /10 s	500 55-110(40-125)			2100 55-110(40-125)

2.3 Fuel deliveries			
Speed control lever	Rot. speed rev/min	Fuel delivery cm³/1000 strokes	Charge-air press. bar (kgf/cm²)
End stop	2430	max. 5,0	
	2350	(6,0 -14,0)	
	2100	36,0-38,0 (34,7 -39,3)	
	1500	(37,7 -42,3)	
	600	30,5-33,5 (29,0 -35,0)	
switch-off	2100	0	
Idle stop	400-500	0	
	350	(6,0 -14,0)	
End stop	400	mind.34,0	
	500	max. 35,0	
2.4 Solenoid	cut-in voltage min. 10,0 V rated voltage 12V		

3. Dimensions	
Designation	for assembly and adjustment mm
K	
KF	5,9 - 6,1
MS	1,4 - 1,6
SVS	max. 2,8
A	
B	
Observations	

Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 PEU 2,3 h 4

1. Edition

En

VE 4/10 F 2075 R 40-3 Overflow temperature 45° C
0 460 404 009

supersedes
company:
engine:

Peugeot
XD 2,5 Autom.

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

--

mm

see VDT-W-460/..

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1400	5,0-5,4 mm	0,67	
1.2 Supply-pump pressure	1400	5,1-5,7 bar (kgf/cm ²)	0,67	
1.3 Full-load delivery with charge-air pressure	500	35,0-36,0 cm ³ /1000 strokes	0	2,5(3,0)
Full-load delivery without charge-air pressure	1000	47,3-49,7 cm ³ /1000 strokes	0,67	
1.4 Idle regulation	425	9,0-13,0 cm ³ /1000 strokes	0	2,5(3,0)
1.5 Full-speed regulation	100	min. 70,0 cm ³ /1000 strokes	0	
1.6 Start	2375	20,0-26,0 cm ³ /1000 strokes	0,67	
1.7 Load-dependent port-closing	1400	--		

Testoil-ISO 4113

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min	750	1400	2000
	mm	1,0-1,8(0,7-2,1)	(4,5-5,9)	7,7-8,5(7,4-8,9)
2.2 Supply pump	n = rev/min	400		2075
	bar (kgf/cm ²)	2,4 - 3,0		6,5 - 7,1
Overflow delivery	n = rev/min	500		2075
	cm ³ /10 s	55 - 110(40-125)		55-110(40-125)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2500	6,0-12,0 (5,0-13,0)	0,67
	2375	(19,0-27,0)	0,67
	2000	43,8-46,2 (42,7-47,3)	0,67
	1750	46,6-49,0 (45,5-50,1)	0,67
	1000	47,3-49,7 (46,2-50,8)	0,67
	+750	41,5-42,5 (39,0-45,0)	0,25
	500	(32,5-38,5)	0

switch-off

2075

0

Idle stop

460-590
425

0

(7,0-15,0)

2.4 Solenoid

cut-in voltage

min. 10 V
rated voltage 12V

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	Maß K1
KF	5,7-5,9
MS	1,0-1,2
SVS	max. 4,0
A	
B	

Observations

* LDA-stroke 3,5 mm.
Use adjusting nut
(46) to correct.

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 PEU 1,3d

1. Edition

En

VE 4/8 F 2500 L 17
0 460 484 002

Overflow temperature 45° C

supersedes
company:
engine:

Peugeot
XL 4 D

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting -- mm

see VDT-W-460/..

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1600	4,3 - 4,7 mm		
1.2 Supply-pump pressure	1600	4,5 - 5,0 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	1250	25,0 - 26,0 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery without charge-air pressure	--	-- cm ³ /1000 strokes		
1.4 Idle regulation	400	8,0 - 12,0 cm ³ /1000 strokes		2,5(3,0)
1.5 Full-speed regulation	100	min. 50,0 cm ³ /1000 strokes		
1.6 Start	2600	15,0-21,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing				

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1000 1,7-2,7(1,5-2,9)	1600 (3,8-5,2)	2200 6,7-7,5(6,4-7,8)	2600 7,9-8,1(7,55-8,95)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	350 1,3 - 1,8		2200 6,0 - 6,5	
Overflow delivery	n = rev/min cm ³ /10 s	500 55-111(40-126)			2500 55-111(40-126)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2700 2600 2450 2000 1250 600	max. 7,0 (14,0-22,0) 23,5-25,5 (22,2-26,8) 23,5-25,5 (22,2-26,8) (23,2-27,8) 18,0-21,0 (16,5-22,5)	
switch-off	2500	0	
Idle stop	450 400	max. 5,0 (6,0-14,0)	
End stop	100-480 550		
2.4 Solenoid	cut-in voltage 10 V rated voltage 12V		

3. Dimensions

Designation	for assembly and adjustment mm
K	3,2-3,4
KF	5,7-5,9
MS	1,9-2,1
SVS	max. 4,4
A	5,8-10,8
B	9,7-14,7

Observations

Clearance between idle
position and stop for
increased idling
0.5-1.0 mm

Testoil-ISO 4113
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Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 PEU 1,5a

1. Edition

En

VE 4/8 F 2500 L 29
0 460 484 003

Overflow temperature 45° C

supersedes
company:
engine:

Peugeot
XID

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/..

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	2200	7,2-7,6 mm		
1.2 Supply-pump pressure	2200	6,4-7,2 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	2000	26,5-27,5 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery without charge-air pressure	--	-- cm ³ /1000 strokes		
1.4 Idle regulation	365	12,0-16,0 cm ³ /1000 strokes		2,5(3,0)
1.5 Full-speed regulation	100	min. 40,0 cm ³ /1000 strokes		
1.6 Start	2650	9,0-15,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing	--	--		

Testoil-ISO 4113

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	800 1,0-2,0(0,8-2,2)	1600 4,6-5,2(4,2-5,6)	2200 (6,7-8,1)	2400 7,9-8,7(7,6-9,0)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	400 1,9-2,7	2500 7,1-7,9		
Overflow delivery	n = rev/min cm ³ /10 s	500 55-111(40-126)	2500 55-111(40-126)		

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2750 2650 2450 2000 1250 600	max. 6,0 (8,0-16,0) 25,5-27,5 (24,2-28,8) (24,7-29,3) 25,8-28,2 (24,7-29,3) 20,0-23,0 (18,5-24,5)	
switch-off	2500	0	
Idle stop	400 365	max. 6,0 (10,0-18,0)	
End stop	100 450-550	min. 40,0	
2.4 Solenoid	cut-in voltage	10 V rated voltage 12 V	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	5,7-5,9
MS	1,7-1,9
SVS	max. 3,0
XK	19,5-21,5
XL	10,9-14,7
A	
B	

Observations
Clearance between idle
position and stop for
increased idling
0.5-1.0 mm

Test Specifications

Distributor-type

Fuel-injection Pumps

VE 4/8 F 2300 L 29-1 Overflow temperature 45° C
0 460 484 004

supersedes
company: Peugeot
engine: XIDL

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/..

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	2200	7,2-7,6 mm		
1.2 Supply-pump pressure	2200	6,4-7,2 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	2000	26,5-27,5 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery without charge-air pressure	--	-- cm ³ /1000 strokes		
1.4 Idle regulation	365	12,0-16,0 cm ³ /1000 strokes		2,5(3,0)
1.5 Full-speed regulation	100	min. 40,0 cm ³ /1000 strokes		
1.6 Start	2450	9,0-15,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing				

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	800 1,1-2,1(0,9-2,1)	1600 4,6-5,2(4,2-5,6)	2200 (6,7-8,1)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	400 1,9-2,7		
Overflow delivery	n = rev/min cm ³ /10 s	500 55-111(40-126)	2300 55-111(40-126)	

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2550 2450 2250 2000 1250 600	max. 6,0 (8,0-16,0) 25,5-27,5 (24,2-28,8) (24,7-29,3) 25,8-28,2 (24,7-29,3) 20,0-23,0 (18,5-24,5)	
switch-off	2300	0	
Idle stop	400 365	max. 6,0 (10,0-18,0)	
End stop	450-550		
2.4 Solenoid	cut-in voltage	10 V rated voltage 12 V	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	5,7-5,9
MS	1,7-1,9
SVS	max. 3,0
XK	19,5-21,5
XL	10,9-14,7
A	
B	

Observations
Clearance between idle
position and stop for
increased idling
0.5-1.0 mm

Testoil-ISO 4113

⑥

Test Specifications Distributor-type Fuel-injection Pumps

46

WPP 001/4 VWV 1,6 b

2. Edition

En

VE 4/9 F 2400 R 66-2

Overflow temperature 45° C

0 460 494 050

 supersedes
company:
engine:

 5.82
VWV
Rabbit

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/.

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	2,0-2,4 mm		
1.2 Supply-pump pressure	1500	5,0-5,6 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	1500	30,0-31,0 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery without charge-air pressure	--	-- cm ³ /1000 strokes		
1.4 Idle regulation	415	6,5-10,5 cm ³ /1000 strokes		2,5(3,0)
1.5 Full-speed regulation	100	min.35,0 cm ³ /1000 strokes		
1.6 Start	2600	11,0-17,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing	--	--		

Testoil-ISO 4113

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1500 (1,5-2,9)	2000 4,3-4,9(3,9-5,3)	2400 6,0-7,0(5,8-7,2)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	400 1,1-1,7		2400 7,5-8,1
Overflow delivery	n = rev/min cm ³ /10 s	500 55-110(40-125)		2400 55-110(40-125)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2750 2600 2400 1500 600	2,0-10,0 (2,0 - 10,0) (10,0- 18,0) 25,9-28,5 (24,9- 29,5) (28,2- 32,8) 17,5-20,5 (16,0- 22,0)	
switch-off	2400	0	
Idle stop	1200 600 415	max.3,0 max.6,0 (4,5-12,5)	
End stop	400 500	min.14 max.20	
2.4 Solenoid	cut-in voltage	min.10,0 V rated voltage 12 V	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	5,7-5,9
MS	1,3-1,5
SVS	max.4,0
+FH	1,8-2,4
AKK	18,4-20,4
B XL	9,1-12,9

Observations

 +operating stroke
(cold-start accel.)

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6.82

A21

A21

Test Specifications

Distributor-type

Fuel-injection Pumps

VE 4/9 F 2100 R 22-3

0 460 494 024

Overflow temperature 45° C

 supersedes
company:
engine:

 Sofim
8140.6.1

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting 0,3 mm $\pm 0,02$ (0,04)

see VDT-W-460/.

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1800	7,4 - 7,8 mm		
1.2 Supply-pump pressure	1800	6,3 - 6,9 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	2000	37,5 - 38,5 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery without charge-air pressure	--	-- cm ³ /1000 strokes		
1.4 Idle regulation	370	8,0-12,0 cm ³ /1000 strokes		2,5(3,0)
1.5 Full-speed regulation	100	min.55,0 cm ³ /1000 strokes		
1.6 Start	2350	19,0-25,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing	1800	--		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min	400	1800	2100
	mm	1,8-2,8(1,6-3,0)	(6,9-8,3)	8,3-9,3(8,1-9,5)
2.2 Supply pump	n = rev/min	400		2100
	bar (kgf/cm ²)	2,9-3,5		6,9-7,5
Overflow delivery	n = rev/min	500		2100
	cm ³ /10 s	55-111(40-126)		55-111(40-126)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2500	max.3,0	
	2350	(18,0-26,0)	
	2100	36,7-39,3 (35,3-40,3)	
	2000	(35,3-40,3)	
	1100	43,5-46,5 (42,7-47,3)	
	600	35,3-38,3 (33,8-39,8)	
switch-off	2100	0	
Idle stop	500	max.3,0	
	370	(6,0-14,0)	
2.4 Solenoid	cut-in voltage	min. 10 V	
		rated voltage 12 V	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	--
KF	5,4-5,6
MS	1,7-1,9
svs	max.2,7
* FH	1,8-2,4
A	
B	

Observations

 * operating stroke
(cold-start accel.)

Testoil-ISO 4113

Test Specifications

Distributor-type

Fuel-injection Pumps

VE 4/10 F 2075 R 40-2

0 460 404 008

Overflow temperature 45° C

 supersedes
company:
engine:

 Peugeot
XD 2 S

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

--

mm

see VDT-W-460/..

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1400	5,0-5,4 mm	0,67	
1.2 Supply-pump pressure	1400	5,1-5,7 bar (kgf/cm ²)	0,67	
1.3 Full-load delivery with charge-air pressure	500	35,0-36,0 cm ³ /1000 strokes	0	2,5(3,0)
Full-load delivery without charge-air pressure	1000	47,3-49,7 cm ³ /1000 strokes	0,67	
1.4 Idle regulation	425	8,0-12,0 cm ³ /1000 strokes	0	2,5(3,0)
1.5 Full-speed regulation	100	min. 70,0 cm ³ /1000 strokes	0	
1.6 Start	2375	20,0-26,0 cm ³ /1000 strokes	0,67	
1.7 Load-dependent port-closing	1400	--		

Testoil-ISO 4113

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	750 1,0-1,8(0,7-2,1)	1400 (4,5-5,9)	2000 7,7-8,5(7,4-8,8)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	400 2,4-3,0		2075 6,5-7,1
Overflow delivery	n = rev/min cm ³ /10 s	500 55-110(40-125)		2075 55-110(40-125)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2500 2375 2000 1750 1000 +700 500	6,0-12,0 (5,0-13,0) (19,0-27,0) (42,7-47,3) 46,6-49,0 (45,5-50,1) 47,3-49,7 (46,2-50,8) 41,5-42,5 (39,0-45,0) (32,5-38,5)	0,67 0,67 0,67 0,67 0,67 0,25 0
switch-off	2075	0	
Idle stop	460-590 425	0 (6,0-14,0)	0 0 0 0
2.4 Solenoid	cut-in voltage	min. 10 V rated voltage 12 V	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	Maß K1
KF	5,7-5,9
MS	1,0-1,2
SVS	max. 4,0
⌘ K	
⌘ L	

Observations

 * LDA-stroke 3,5 mm.
Use adjusting nut
(46) to correct.

Test Specifications

Distributor-type

Fuel-injection Pumps

En

VE 6/10 F 1800 L 93

0 460 406 011

Overflow temperature 45° C

 supersedes
company:
engine:

 --
Volvo-Penta
MD 40 "C"

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

mm

see VDT-W-460/.

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	3,5-3,9 mm		
1.2 Supply-pump pressure	1500	6,5-7,1 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	1500	44,0-45,0 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery without charge-air pressure	--	-- cm ³ /1000 strokes		
1.4 Idle regulation	350	5,0- 9,0 cm ³ /1000 strokes		2,5(3,0)
1.5 Full-speed regulation	100	min.60,0 cm ³ /1000 strokes		
1.6 Start	1900	32,5-38,5 cm ³ /1000 strokes		
1.7 Load-dependent port-closing				

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1000 1,1-1,9(0,8-2,2)	1500 (3,0-4,4)	1800 4,7-5,5(4,4-5,8)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	600 3,2-3,8		1800 7,5-8,1
Overflow delivery	n = rev/min cm ³ /10 s	500 55-110(40-125)		1800 55-110(40-125)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2210-2280 2000 1900 1800 1500 600	0 21,5-29,5 (21,5-29,5) (31,5-39,5) 41,5-44,5 (40,7-45,3) (42,2-46,8) 37,5-40,5 (36,0-42,0)	
switch-off	1800	0	
Idle stop	380-450 350	0 (3,0-11,0)	
2.4 Solenoid	cut-in voltage	min.10 V rated voltage 12 V	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	
KF	
MS	
SVS	
A	
B	

Observations

Test Specifications

Distributor-type

Fuel-injection Pumps

VE 3/10 F 1800 L 33

0 460 403 001

Overflow temperature 45° C

supersedes

company:

Bukh

engine:

DV 36 ME

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting 0,2 mm \pm 0,02(0,04)

see VDT-W-460/..

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1600	5,0-5,4 mm		
1.2 Supply-pump pressure	1600	6,2-6,8 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	1600	28,5-29,5 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery without charge-air pressure	--	-- cm ³ /1000 strokes		
1.4 Idle regulation	450	6,0-10,0 cm ³ /1000 strokes		2,5(3,0)
1.5 Full-speed regulation	100	min. 38,0 cm ³ /1000 strokes		
1.6 Start	1850	20,0-26,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing				

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1000 1,4-2,2(1,1-2,5)	1400 3,8-4,4(3,4-4,8)	1600 (4,5-5,9)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	400 2,4-3,0		1800 6,7-7,3)
Overflow delivery	n = rev/min cm ³ /10 s	500 55-110(40-125)		1800 55-110(40-125)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	1930-2000 1900 1850 1800 1600 1000 600	0 max. 6,0 (19,0-27,0) 28,3-30,7 (27,2-31,8) (27,2-30,8) 29,5-30,5 (27,7-32,3) 19,5-22,5 (18,0-24,0)	
switch-off electr. mech.	1800	0	
Idle stop	500-570 450	0 (4,0-12,0)	
2.4 Solenoid	cut-in voltage	min. 10 V rated voltage 12 V	

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	
KF	5,9-6,1
MS	1,2-1,4
SVS	max. 6,0
A	3,5-6,7
B	

Observations

Test Specifications

Distributor-type

Fuel-injection Pumps

En

VE 3/10 F 1950 R 46-1

0 460 403 005

Overflow temperature 45° C

supersedes

--

company:

Fiat

engine:

8130.61.200

All test specifications are valid only for Bosch Fuel-injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting 0,3

mm

see VDT-W-460/..

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1500	4,0-4,4 mm		
1.2 Supply-pump pressure	1500	5,4-6,0 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	1500	39,5-40,5 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery without charge-air pressure	--	-- cm ³ /1000 strokes		
1.4 Idle regulation	350	8,0-12,0 cm ³ /1000 strokes		2,5(3,0)
1.5 Full-speed regulation	100	min. 40,0 cm ³ /1000 strokes		
1.6 Start	2200	7,0-13,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing	1500	--		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min	1000	1500	1800
	mm	1,7-2,5(1,4-2,8)	(3,5-4,9)	5,0-5,6(4,6-6,0)
2.2 Supply pump	n = rev/min	600		1950
	bar (kgf/cm ²)	2,3-2,9		7,0-7,6
Overflow delivery	n = rev/min	500		1950
	cm ³ /10 s	55-110(40-125)		55-110(40-125)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2300 2200 1950 1500 600	max. 5,0 (6,0-14,0) 37,0-39,0 (35,7-40,3) (47,7-42,3) 30,5-33,5 (29,0-35,0)	
switch-off	1950	0	
Idle stop	400-500 350	0 (6,0-14,0)	
Endanschlag	400 500	min. 34,0 max. 35,0	
2.4 Solenoid	cut-in voltage min. 10 V rated voltage 12 V		

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	--
KF	5,9-6,1
MS	1,4-1,6
SVS	max. 2,8
✕ K	
B xL	

Observations

Electric stop control
a 300 min/1. Residual
quantity max 2.5 mm³/
stroke

Testoil-ISO 4113

②

Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 BOS 12,3 1

1. Edition

En

PE 6 P 120 A 821 LS253 RQ 250/1150 PA209R

supersedes -
company: MAN-Büssing
engine: D 3256 BYUL
176kW (240 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,80-2,90
(2,75-2,95) mm (from BDC) Cyl.6

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	10,0	17,9 - 18,2	0,4(0,8)			
250	+ 0,1 7,4-7,6	4,6 - 5,2	0,4(0,7)			
500	- - -	C, 4 - 5	0,6(1,0)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
1500	15,6-16,4	500	16,0	9,0	1195-1210	250	4,0	100	min.7,0	-	-
1150	15,6-16,0			4,0	1230-1260			250	3,9-4,1		
1360	0 - 1							280-400	320 = 2,0 0 - 1		

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery Idle speed	
②		③a		③b		⑥	
rev/min 1	cm ³ /~1000 strokes 2	rev/min 3	Control rod travel mm	rev/min 4	cm ³ /~1000 strokes 5	rev/min 6	Control rod travel mm cm ³ /1000 strokes/mm 7
1150	179,5 - 181,5 (176,5 - 184,5)	1150		500	123,0 - 128,0 (120,0 - 131,0)	100	280,0 - 300,0

Checking values in brackets

1.78

Testoil-ISO 4113

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Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4 BOS 12,3 1

2. Edition

En

PE 6 P 120 A 821 LS263

RQ 250/1150 PA209R

supersedes

company: HAM-Büssing
D 3256 RYUL
engine: 176 kW (240 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

2,80-2,90
(2,75-2,95)

mm (from BDC)

Cyl.6

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	10,0	17,9 - 18,2	0,4(0,8)			
250	+0,1 7,4-7,6	4,6 - 5,2	0,4(0,7)			
500	- - -	C, 4 - 5	0,6(1,0)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3		Test specifications Control rod travel mm 5 rev/min 6		Idle speed regulation Setting point rev/min 7		Test specifications Control rod travel mm 9 rev/min 10		Torque control rev/min 11 Control rod travel mm 12	
500	15,6-16,4	500	16,0	9,0	1195-1210	250	4,0	100	min.7,0	-	-
				4,0	1230-1260			250	3,9-4,1		
								280-	320=2,0		
1360	0 - 1							400	0 - 1		

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle speed rev/min 6	
	cm ³ /-1000 strokes 2				cm ³ /-1000 strokes 5		Control rod travel mm 7
1150	179,5-181,5 (176,5-184,5)	1195-1210*		500	123,0-128,0 (120,0-131,0)	100	280,0-300,0

Checking values in brackets

11.80

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps ① and Governors

PES 6 P 110 A 720 LS295 RQV 250-1100 PA334R

supersedes 3.78
company: M A N
engine: D 2566 MTE

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{3,00-3,10}{(2,95-3,15)}$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	13,0 +0,1	15,1 - 15,3	0,4(0,8)			
250	7,9-8,1	1,6 - 2,2	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 55	1100 1300	15,2-17,8 0 - 1	-	-	-	ca. 13	100 250 380-420 = 2,0 450	min 9,5 7,9-8,1 0 - 1	200 1100	0,2-0,8 8,6
ca. 50	12,0 4,0	1140-1150 1215-1245				③a			-	-

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1100	151,0-153,0 (148,0-156,0)	1140-1150*			100	215,0-235,0		
					100-170 (80-190)			

Checking values in brackets

* 1 mm less control rod travel than col. 2

TEX/Pu

9.78

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Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 9,6 d

1. Edition

En

PE 6 P 100 A 320 LS805 RQV 350-1250 PA251R

6 - 3 - 5 - 2 - 4 - 1 $\pm 0,5$ ($\pm 0,75$)

0 -45 -120-165-240-285°

** Set at the reduced-delivery stop.

supersedes

company: Daimler-Benz

engine: OM 401

(192 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,40-3,50 mm (from BDC) Cyl. 6
(3,35-3,45)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1230	10,4	10,3 - 10,5	0,3(0,6)			
350	(+0,1) 7,8-8,0	2,3 - 2,8	0,4(0,7)			
1230	-	C, 4 - 5 -	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1250 1500	15,2-17,8 0 - 1	-	-	-	ca. 17	150 350 700-760 = 2,0 900	min. 9,5 6,9-7,1 0 - 1	300 1285	0,4-1,6 8,3
ca. 68	9,4 4,0	1280-1290 1345-1375				3a			-	-

Torque control travel a = - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed rev/min ④a	Fuel delivery characteristics ⑤a high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control ⑤ travel Control rod travel mm 9	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	mm 9
1230	103,0-105,0	1280-1290*	1230	77,0-79,0** (75,0-81,0)	100	110,0-130,0		
			1360	4,1-4,3mmRW dispersion max. 4	350	24,0- 29,0		
						100-270(80-290)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

8.77

Testoil-ISO 4113

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①

Test Specifications Fuel Injection Pumps ① and Governors

40

VDT-WPP 001/4 MB 16,0e

1. Edition

En

PE 10 P 100 A 320 LS821 RQV 350-1100 PA 319 DR

supersedes -

company:

Daimler-Benz

engine:

OM 403

Cam sequence and angular cam spring

10 - 9 - 4 - 1 - 8 - 7 - 6 - 3 - 5 - 2 - 10

0 - 45 - 72-117-144-189-216-261-288-333-360°

(+0,5
-0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,4+0,1 mm (from BDC) (+0,5
-0,05) Cyl. 10

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	11,7 - 12,4	0,4			
600	9	5,0 - 6,2				
600	15	15,3 - 17,0				
200	9	3,5 - 4,5				

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1140 1180 1240 1320	15,0-18,0 7,8-13,0 0 - 7,7 0	-	-	-	ca. 15	200 350 550 830	8,4-10,3 5,7- 7,8 3,0- 4,7 0	300 500 1140 1080 600	0,4-1,4 2,2-2,8 8,3 0 0,5-0,6

Torque control travel a = 0,5 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min	cm³/1000 strokes	rev/min ④a	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1080	85,0-87,0 (83,0-89,0)	1150-1165*	900	82,0-85,0 (80,0-87,0)	100	110,0-130,0		
			700	77,0-80,0 (75,0-82,0)	1215-1265,4mmRW dispersion max. 6 Change-over point 200-250 min⁻¹			

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

①

Test Specifications Fuel Injection Pumps ① and Governors

40

WPP 001/4 MB 9,6 m 1

1. Edition

En

PES 5 P 100 A 820 LS 416 RQV 300-1100 PA 594

1 - 3 - 5 - 4 - 2 je $72^\circ \pm 0,5^\circ (\pm 0,75^\circ)$

supersedes

company:

engine:

Daimler-Benz

OM 409

141,0 kW(192 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

3,00-3,10
(2,95-3,15)

mm (from BDC)

Cyl. 5

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	10,8±0,1	12,2-12,4	0,3(0,6)			
300	7,0-7,2	1,0- 1,6	0,3(0,5)			
1200	3,0-3,2	C, col. 6,7	0,4(0,6)			

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 49	1100 9,8 4,0	15,2-17,8 1140-1150 1175-1205	-	-	-		300	7,1		
						330-390 (3a)	100 min. 8,5 300 7,0-7,2 =2,0 320-435			

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery Idle switching point ⑥		Torque-control ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1100	122,0-124,0 (120,0-126,0)	1140-1150*			100	130,0-150,0	-	-
					1200	11,0- 19,0		

Checking values in brackets

* 1 mm less control rod travel than col. 2

4.81

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B17

9.17

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MAN 11,103

1. Edition

En

Testoil-ISO 4113

PES 6 P 110 A 720 LS 295 RQV 750 PA 377 R

RQV 750 PA 343 R

supersedes

company: MAN

engine: D 2566 MTE

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke ^{3,0-3,1}
 (2,95-3,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
725	12,6+0,	15,2 - 15,4	0,4(0,8)			
250	7,8-8,0	2,8 - 3,4	0,6(1,0)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

.. PA 377 R, .. PA 343 R

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 29	11,6 4,0	745-755 765-785	-	-	-	-	-	-	-	-
						3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2)		Rotational-speed limitation intermediate speed (2b) (4a)	Fuel delivery characteristics high idle speed (5a) (5b)		Starting fuel delivery Idle switching point (6)		Torque-control travel (5) Control rod travel mm	
rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	Control rod travel mm 9
725	152,0-154,0 (149,0-157,0)	745-755*	-	-	100	12,6 - 12,7 mm RW	-	-

Checking values in brackets

* 1 mm less control rod travel than col. 2

5.81

②

Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 MB 9,6 m

2. Edition

En

PES 5 P 100 A 820 LS 416 RQ 300/1100 PA 327R

1 - 3 - 5 - 4 - 2

0 -72 -144-216-288 \pm 0,5(\pm 0,75°)

supersedes 3.81

company: Daimler-Benz

engine: OM 409

141 kW(192 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke (2,95-3,15)
 3,00-3,16 mm (from BDC) RW 10,5

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	13,6	12,2 - 12,4	0,2(0,25)			
	+ 0,1					
300	8,3-8,5	1,0 - 1,6	0,2(0,25)			

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

B. Governor Settings

Checking of slider PRG check ①		Full-load speed regulation ④				Idle speed regulation ⑤				Torque control ③	
rev/min 1	Control rod travel mm 2	Setting point rev/min 3	Control rod travel mm 4	Test specifications Control rod travel mm 5	rev/min 6	Setting point rev/min 7	Control rod travel mm 8	Test specifications rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
600	13,8-14,6	600	14,2	12,6	1140-1155	300	8,4	100	min.10,0		
1300	0 - 1			4,0	1175-1205			300	8,3-8,5		
								375-	415 =2,0		

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At 1145-1160 min⁻¹1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes/mm 7
1100	122,0-124,0 (120,0-126,0)				100	130,0-150,0

Checking values in brackets

8.81

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B22

B22

②

Test Specifications Fuel Injection Pumps ② and Governors

40

WPP 001/4 MB 11,4 g

3. Edition

En

PES 6 P 110 A 820 LS 422

RQ 300/1100 PA 327-2

supersedes

2.81

company:

Daimler-Benz

engine:

OM 407

176,5 kW(240PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

(2,95-3,15)

Cyl.6

Port closing at prestroke

3,00-3,10

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	11,7	13,0-13,2	0,2(0,25)			
300	+ 0,1 7,6-7,8	1,1 - 1,7	0,2(0,25)			
600	11,7+0,1	C, col.4-5	0,6(1,0)			

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

B. Governor Settings

Checking of slider PRG check rev/min 1		Control rod travel mm 2		Full-load speed regulation Setting point rev/min 3		Control rod travel mm 4		Test specifications Control rod travel mm 5		rev/min 6		Idle speed regulation Setting point rev/min 7		Control rod travel mm 8		Test specifications rev/min 9		Control rod travel mm 10		Torque control rev/min 11		Control rod travel mm 12	
600		13,0-14,0		600		13,5		10,7		1145-1160		300		7,7		100		min.10,0					
								4,0		1180-1210						300		7,6-7,8					
																375-		415 =2,0					

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle speed rev/min 6		Control rod travel mm 7	
1100	130,0-132,0 (127,0-135,0)			600	118,0-122,0 (115,0-125,0)	100		130,0-150,0	
						300		13,0 - 19,0	

Checking values in brackets

8.81

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C2

C2

Test Specifications Fuel Injection Pumps ② and Governors

VDT-WPP 001/4 BOS 12,3k

1. Edition

En

PE 6 P 110 A 821 LS 253 RQ 250/1150 PA 209

supersedes -

company:

Büssing

engine:

U 12 D

(256 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke $2,8 + 0,1$ mm (from BDC) $+ 0,15 - 0,05$

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	13,1 - 13,9	0,5			
600	9	7,2 - 8,4				
600	15	17,2 - 19,4				
200	9	5,5 - 6,7				

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
550	15,7-16,3	550	16,0	1170 1200 1230 1290	15,6-16,0 8 - 14 0 - 9,5 0	470	0	100 200 300 370	6,1-8,1 4,3-6,3 0,8-3,2 0	-	-

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery Idle speed	
②		③a		③b		⑥	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes/mm 7
40° 1150	139,0-141,0 (137,0-143,0)	1170				100	24,0 - 26,0

Checking values in brackets

10.75

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 MWM 53,1 b

1. Edition

En

- (1) PE 8 P 120 A 500/5 LS 243
(2) PE 8 P 120 A 520/5 LS 250 RSUV 300-750 P 9 A 332/1 R
(3) PE 8 P 120 A 500/5 LS 306
1-6-8-2-4-7-3-5 (1) 1-6-2-8-4-7-3-5

supersedes

company

engine

Südbremse

D/TD/TBD 602V 16

602V 16 S

0-45-90-90-135-180-225-315 $\pm 0,5^\circ$ 0-45-90-180-180-225-270-315 $\pm 0,5^\circ (\pm 0,75^\circ)$

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

(2,25-2,45)

mm (from BDC)

RW = 21,0 mm

Komb.-Nr. 0 401 818 015 (1)

0 401 878 075 (2)

0 401 818 017 (3)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
700	13,0 $\pm 0,1$	26,6-27,0	0,5			
		(26,3-27,3)	(0,9)			
300	5,5-5,7	2,8 - 3,6	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
loose	800	0,3-1,0	-	-	-	ca. 29	300	5,1	700	13,0 $\pm 0,1$
	x = 5,25						100		325	14,2 $\pm 0,6$
							300	5,5-5,7	450	13,0 $\pm 0,1$
ca. 70	12,0	790-800					315-375	= 2,0mm		
2a	4,0	815-845								
	980	0,3-1,7								

The numbers denote the sequence of the tests

without (1), (3) and

C. Settings for Fuel Injection Pump with Fitted Governor

(2)

2b Full-load stop		6 Rotational speed limit		3a Fuel delivery characteristics		Starting fuel delivery 5		4a Idle stop	
Test oil temp 40°C (104°F)		Note changed to rev/min				Idle			
rev/min	cm ³ /1000 strokes			rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9
The full-load delivery is adjusted on the engine in accordance with the engine inspection sheet. Pumps (1) and (2) or (1) and (3) operate in tandem.									

Checking values in brackets

* 1 mm less control rod travel than col 2

1.82

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Test Specifications Fuel Injection Pumps **(1A)** and Governors

40

WPP 001/4 MWM 33,2 e 1

1. Edition

En

PE 6 P 130 A 320 LS 3025 RSUV 300-750 P 9 A 332/1 R

supersedes -
company Südbremse
engine

1 - 6 - 2 - 4 - 3 - 5

0 - 15 -120-135-240-255° ± 0,5° (± 0,75°)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\overset{2,8 - 2,9}{(2,75-2,95)}$ mm (from BDC) RW = 21,0 mm

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
750	12,0+0,1	33,8-34,2	0,5			
		(33,5-34,5)	(0,9)			
300	4,8-5,0	2,1 - 2,7	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3 - 1,0	-	-	-	ca. 28	300	4,4	750	12,0+0,1
	x =	5,25							325	13,2+0,6
ca. 66	11,0	790-800					300	4,8-5,0	400	12,0+0,1
②a	4,0	820-850					310-	370 = 2,0mm		
	900	0,3-1,7								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limit		③a Fuel delivery characteristics		Starting fuel delivery ⑤		④a Idle stop	
Test oil temp 40°C (104°F)		Note changed to)				Idle			
rev/min 1	cm ³ /1000 strokes 2	rev/min 3		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
The full-load delivery is adjusted on the engine in accordance with the engine inspection sheet.									

Checking values in brackets

* 1 mm less control rod travel than col 2
1.82

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C16

C16

Test Specifications Fuel Injection Pumps ① and Governors

En

PE 6 P 110 A 320 LS 3805

RQV 300-1150 PA 524-1

supersedes 4.81
company: Daimler-Benz
engine: OM 421
158 kW (215 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

(3,95-4,15)

RW 10,5

Port closing at prestroke

4,00-4,10

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	12,6+0,1	13,4-13,6	0,4(0,8)			
300	7,7-7,9	1,0 - 1,6	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
max.	1150	15,2-17,8				ca. 19	100 300	min. 10 8,3-8,5	300 460	2,6 3,1-3,4
ca. 65	11,6 4,0 1400	1190-1200 1240-1270 0 - 1,0				330-730 (3a)	680-740 = 2,0		1200	8,4

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1150	134,0-136,0 (131,0-139,0)	1190-1200*	600	123,0-127,0 (120,0-130,0)	100	140,0-160,0		
						220-100(80-240)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 18,3 b

3. Edition

En

PE 10 P 110 A 320 LS 3808 RQV 300-1150 PA 524-2

supersedes 5.81
company: Daimler Benz
engine: OM 423
259 kW (352 PS)

10 - 9 - 4 - 1 - 8 - 7 - 6 - 3 - 5 - 2

0 -45 - 72-117-144-189-216-261-288-333 ± 0,50°(± 0,75°) -

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (3,95-4,15) mm (from BDC) Cyl. 10
4,00-4,10

Rotational speed rev/min 1	Control rod travel mm 2 +0,1	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	12,2	12,3 - 12,5	0,4(0,8)			
300	8,0-8,2	1,3 - 1,9	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1150 1300	15,2-17,8 0 - 0,5	-	-	-	ca. 18	100 300	min. 10,1 8,0-8,2	250 550 850 1150	1,0-1,2 3,4-3,7 4,9-5,3 7,7
ca. 66	11,2 4,0	1190-1200 1245-1275				330-465 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery Idle switching point ⑥		Torque-control ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1150	123,0-125,0 (120,0-128,0)	1185-1195*	600	115,0-119,0 (112,0-122,0)	100	130,0-150,0		

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 12,8 b 1

1. Edition

En

PE 8 P 100 A 320 LS 810Z RQV 300-1250 PA227R

supersedes 1.78

company: Daimler-Benz

engine: OM 402

8 - 7 - 2 - 6 - 3 - 5 - 4 - 1
0 -45-90 -135-180-225-270-315° ($\pm 0,50$)
 $\pm 0,75$

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{3,40-3,50}{(3,35-3,55)}$ mm (from BDC) Cyl. 8

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	11,7-12,4	0,4			
600	9	5,0- 6,2				
600	15	15,3-17,0				
200	9	3,5- 4,5				

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel ①	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1230 1300 1340 1410	16,0-19,2 6,0-12,4 0 - 9 0	-	-	-	ca. 12	150 300 450 680	7,2-8,1 4,6-6,7 1,5-2,9 0	300 800 1250 -----	0,4-1,5 4,4-4,8 8,2 -----

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery Idle switching point ⑥		Torque-control ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
"Z" 1250	88,0-90,0	1290-1310*	600	66,5-71,5				
						180-250 (160-270)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 17,4 c

2. Edition

En

PE 10 P 100 A 320 LS 847 RQV 350-1150 PA 378 R

10 - 9 - 4 - 1 - 8 - 7 - 6 - 3 - 5 - 2

0 -45 -72 -117-144-189-216-261-288-333 $\pm 0,5^\circ$ ($\pm 0,75^\circ$)

supersedes

company:

engine:

4.81

Daimler Benz

OM 403

259 kW (352PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke (3,35-3,55) mm (from BDC) RW 10,5
 3,40-3,50

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 8
1130	12,6	11,5 - 11,7	0,3(0,6)			
	+ 0,1					
350	8,3-8,4	1,2 - 1,8	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1130 1400	15,2-17,8 0 - 1,0				ca. 12	100 300	min. 7,5 6,0-6,2		
ca. 62	11,6 4,0	1170-1180 1285-1310				375-490 3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1130	115,0-117,0 (113,0-119,0)	1175-1180*			100	130,0-150,0		
						100-220(80-240)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4

1. Edition

En

PE 6 P 120 A 320 RS 391

RQV 225-1100 PA 458

supersedes

company: Berliet
engine: L 12

1 - 5 - 3 - 6 - 2 - 4

0 - 60-120-180-240-300 \pm 0,50 (0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke $\frac{3,40-3,50}{(3,35-3,55)}$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	10,2-10,3	17,3 - 17,5	0,4(0,8)			
225	6,0-6,2	1,6 - 2,0	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel ①	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	①a Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	④ Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	③ rev/min 10	mm 11
ca. 68	1100 1300	15,2-17,8 0 - 1	-	-	-	ca. 25	100 225	min. 7,7 6,0-6,2	225 490	1,4 3,8-4,1
ca. 58	9,2 4,0	1140-1150 1180-1210				③a	320-370=2,0		1150	8,3

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery Idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1100	173,0-175,0 (170,0-178,0)	1140-1150*			100 225 100	120,0-155,0 16,0- 20,0 170(80-190)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

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Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MAN 20,9 g

1. Edition

En

Testoil-ISO 4113

PE 12 P 100 A 520/4 LS823 RQ 900 PA392R

supersedes

company:

MAN
D2542 ME

engine:

(Nr. 7898-228kW-310PS)

12 - 1 - 5 - 9 - 8 - 3 - 4 - 11 - 10 - 2 - 6 - 7
0 -45 -60 -105-120-165-180-225 -240 -285-300-345
+0,50 (+0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,10-3,20
(3,05-3,25) mm (from BDC) Cyl. 12

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
850	14,6-14,7	10,9 - 11,1	0,3(0,6)			
250	10,4-10,6	1,8 - 2,4	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever	rev/min 5	Control rod travel mm 4	Degree of deflection of control lever	rev/min 8	Control rod travel mm 3	rev/min 10	mm 11
1			4			7				
	3,6	900-905								
	8,5	930-940								
						3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
850	109,0-111,0 (107,0-113,0)	900-905*						

Checking values in brackets

* 1 mm less control rod travel than col. 2

8.79

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Test Specifications

Fuel Injection Pumps ① and Governors

Testoil-ISO 4113

PE 12 P 110 A 520 LS 839 RQV 250-1150 PA 353 R

supersedes MAN

company: D2542 MTE

engine: (343kW-466PS)

 12 - 1 - 5 - 9 - 8 - 3 - 4 - 11 - 10 - 2 - 6 - 7
 0 -45 -60 -105-120-165-180-225 -240 -285 -300-345°
 ± 0,50 (+0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke $\frac{3,00-3,10}{(2,95-3,15)}$ mm (from BDC) Cyl. 12

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,9-12,0	14,2 - 14,4	0,4(0,8)			
250	-	1,1 - 1,7	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca.67	1150	15,2-17,8				ca.11	100	min.7,5	200	0,2-1,2
	1450	0 - 1,0					250	5,9-6,1	400	2,2-3,0
ca.66	10,9	1190-1200					470-530 = 2,0		1170	8,6
	4,0	1310-1340				3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1150	142,0-144,0 (139,0-147,0)	1190-1200*					1150 11,9-12,0	
						100-170 (80-190)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

10.79

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Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 FIA 13,8 n

2. Edition

En

PE 8 P 120 A 920/5 LS 3812

RQV 300-1200 PA 357R

supersedes 10.80

company: Fiat

engine: 8281.02.001

257 kW(350 PS)

1 - 8 - 4 - 3 - 6 - 5 - 7 - 2
0 -45 -90 -135-180-225-270-315

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

(3,45-3,65)

Port closing at prestroke

3,50-3,60

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1200	9,3-9,4	17,3-17,7	0,5(0,9)			
300	5,9-6,1	2,8- 3,6	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	①a	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm ④	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm ③	① rev/min 10 mm 11
ca .68	1200 1450	15,2-17,8 0 - 1					ca .10	100 300	min.7,5 5,9-6,1	
ca .63	8,3 4,0	1240-1250 1305-1335					③a	330-430 = 2,0		

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2)		Rotational-speed limitation intermediate speed (2b) (4a)	Fuel delivery characteristics high idle speed (5a) (5b)		Starting fuel delivery Idle switching point (6)		Torque-control travel (5) Control rod travel mm	
rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	Control rod travel mm 9
1200	173,0-177,0 (170,0-180,0)	1240-1250*			100 300	19,5-21,0 mm RW 28,0-36,0		

Checking values in brackets

* 1 mm less control rod travel than col. 2

①

Test Specifications Fuel Injection Pumps ① and Governors

VDT-WPP 001/4 VOL 7,0 c

40

2. Edition

En

PE 6 P 100 A 320 RS 269

RQV 250-1200 PA 231/2 R

supersedes

Volvo

company:

TD 70 D

engine:

Port-closing test with/without ROBO diaphragm
See page 2!

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $3,0 + 0,1$ mm (from BDC)

(+ 0,15)
(- 0,05)

Testoil-ISO 4113

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	11,3 - 12,0	0,5			2,5 ± 0,1** (max. 2,2-2,9)
600	9	4,4 - 5,4				
	12					
	15	16,2 - 17,9				
200	9	2,8 - 3,8				

Adjust the fuel delivery from each outlet according to the values in .

** In the case of greater dispersion alter the delivery-valve spring pre-tension accordingly

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 50	1290	15,0-18,4				ca. 13	100	8,8-11,0	350	1,4-2,0
	1560	0						7,1- 9,9	600	4,4-4,8
ca. 45	1200	15,0-18,2					200	3,8- 6,8	1290	8,2
	1300	8,2-13,3					300	0 - 3,6		
	1400	0 - 7,4					400	0		
	1510	0					510			

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ④a	Fuel delivery characteristics ⑤a high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
(1- 269) 700	83,0-85,0 (82,0-86,0)	1230-1240*			100	165,0-205,0		
					225	10,0- 14,0 dispersion max.2,5)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

D8

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6.75

Test Specifications Fuel Injection Pumps ① and Governors

VDT-WPP 001/4

6. Edition

En

PE 6 P 120 A 320 RS 278

RQV 250-1100 PA 243 R

supersedes 7.74, 11.74

company: AEC

engine: T.L. 12

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,4+0,1 mm (from BDC) +0,15-0,05,

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	19,7 - 20,3	0,5			
600	9	8,4 - 9,6				
600	15	18,6 - 20,4				
200	9	3,3 - 4,3				

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

RQV ...243 R

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 61	1110 1150 1200 1260	15,0-18,3 8,2-13,6 0 - 7,2 0	-	-	-	ca. 25	80 150 250 330	7,0-11,0 5,1- 8,6 1,1- 4,8 0	350 750 1110	5,2-3,6 4,9-5,3 8,3

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics		Starting fuel delivery idle switching point		Torque-control	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1100	229,0-231,0 (227,0-233,0)	1120			100	22,5-24,5		
					200	1,5 - 2,1		

Checking values in brackets

* 1 mm less control rod travel than col. 2

11.75

Testoil-ISO 4113

①

Test Specifications Fuel Injection Pumps ① and Governors

40

VDT-WPP 001/4 SCA 8,0 b

4. Edition

En

PE 6 P 110 A 720 RS 261

RQV 250-1200 PA 215 R

supersedes -

company: Scania

engine: D 8

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	9,0 - 9,7	0,4			
600	9	-				
600	15	14,0 - 15,8				
200	9	1,2 - 2,0				

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 50	1220 1300 1400 1480	15,0-18,0 8,1-13,4 0 - 6,6 0	-	-	-	ca. 13	100 200 300 470	8,6-11,0 7,2- 9,3 3,6- 7,0 0	250 400 600 1000 1220	0,2-1,2 1,8-2,4 3,7-4,2 6,0-6,4 8,3
						③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ④a	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1200	88,5-91,5 (86,5-93,5)	1230	600 1300	83,5-88,5 (81,5-90,5) 38,0-43,0 (36,0-45,0)	100 225	130 - 170 11 - 13) dispersion max. 1,5		

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.75

D10

D10

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①

Test Specifications Fuel Injection Pumps ① and Governors

40

WPP 001/4 MB 19,1 g

1. Edition

En

PE 12 P 100 A 320 LS 831 RQ 1150 PA310R

supersedes -

12 - 1 - 5 - 9 - 8 - 3 - 4 - 11 - 10 - 2 - 6 - 7 ± 0,5
0 - 45-60 -105-120-165-180-225-240-285-300-345° (0,75)

company:

Daimler-Benz
OM 404

engine:

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,20-3,30 mm (from BDC) Cyl. 12
(3,15-3,35)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1130	11,5	9,9 - 10,1	0,3(0,6)			
350	(+0,1) 7,4-7,6	0,5 - 1,1	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 33	10,5 4,7 1300	1150-1160 1200-1210 0 - 1	-	-	-	-	-	-	1150	5,5

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics		Starting fuel delivery idle switching point		Torque-control	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1130	99,0-101,0 (97,0-103,0)	1150-1160*			100	15 - 16		
					1205	4,6-4,8 dispersion max.4(6)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

10.77

①

Test Specifications Fuel Injection Pumps ① and Governors

40

WPP 001/4 MB 19,1 i 1

1. Edition

En

PE 12 P 110 A 320 LS 830 RQ 1050 PA 374 R

supersedes

company: Daimler-Benz

engine: OM 404 A
(336 kW - 457 PS)12 - 2 - 5 - 9 - 8 - 3 - 4 - 11 - 10 - 2 - 6 - 7 ±0,50
0 - 45 - 60 - 105 - 120 - 165 - 180 - 225 - 240 - 285 - 300 - 345 (±0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

3,20-3,30
(3,15-3,35)

mm (from BDC)

Cyl. 12

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1000	12,9-13,0	14,0-14,2	0,4(0,8)			
300	7,3-7,5	1,1 - 1,7	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
	11,9 6,0 0-1	1055-1060 1095-1105 1200								

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Torque-control	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1000	140,0-142,0 (137,0-145,0)				100	110,0-130,0		

Checking values in brackets

* 1 mm less control rod travel than col. 2

10.79

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D14

DAV

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 MWM 19,9 a

1. Edition

En

PE 6 P 110 A 300 RS 277

Komb.-Nr. 0 401 816 049

supersedes 8.78
company Südbremse
engine D 601-6(Marine)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (1,95-2,15) mm (from BDC)

RW 21,0 mm

Testoil-ISO 4113

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	12,3±0,1	16,3-16,7	0,4			
300	7,0-7,2	(16,1-16,9) 2,7- 3,5	(0,8) 0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery Idle		4a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ..) rev/min							
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9	
The full-load delivery is adjusted on the engine in accordance with the engine inspection sheet.					100	19,5-21,0			

Checking values in brackets

* 1 mm less control rod travel than col 2

1.82

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Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 PEN 12,0 C

2. Edition

En

PE 6 P 120 A 320 RS 241

EP/RSV 200-900 P 4/421R

supersedes 3.78

company Volvo-Penta

engine TAMD 120 A

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,60-2,70
(2,55-2,75) mm (from BDC)

Testoil-ISO 4113

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	11,3	21,2-21,4	0,5(0,8)			2,5 ± 0,1** (max.2,2-2,9)
200	+0,1 6,0-6,1	1,6- 2,6	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in

** In the case of greater dispersion alter the delivery-valve spring pre-tension accordingly.

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
loose	800	0,3 - 1,0				ca.22	200	5,5		
	X =	5,0								
ca.55	10,3	940-950					100	min. 20		
	4,0	966-996					200	6,0-6,1		
2a							255-315	= 2,0		
	1010	0,3-1,7					400	0 - 1		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F) rev/min 1		6 Rotational-speed limit Note: changed to) rev/min 3	3a Fuel delivery characteristics rev/min 4		Starting fuel delivery Idle rev/min 6		5	4a Idle stop rev/min 8		Control rod travel mm 9
cm ³ /1000 strokes 2			cm ³ /1000 strokes 5		cm ³ /1000 strokes 7					
700		940-950*			100		460 - 500			
					200		12 - 26)*			
					dispersion		max.4			
					981		3,9-4,1mmRW			
					dispersion		max.6(9)			

Checking values in brackets

* 1 mm less control rod travel than col 2

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10.78

D19

2.19

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 MB 11,4 k

1. Edition

En

PES 6 P 100 A 820 LS 430

RSV 350 - 1100 PO/485

supersedes -

company

engine

Daimler-Benz

OM 407

162 kW (220 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,0-3,1
(2,95-3,15) mm (from BDC)

Cyl.6

Testoil-ISO 4113

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1080	12,5+0,1	11,2-11,4	0,3(0,6)			
350	8,5-8,7	1,2- 1,8	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800	0,3-1,0	-	-	-	ca. 28	350	8,6		
	x =						350	8,5-8,7		
							450-510	2,0		
ca. 51	11,5	1130-1145								
2a	4,0	1205-1235								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery 5		4a Idle stop	
Test oil temp 40°C (104°F)		Note: changed to ... rev/min				Idle			
rev/min 1	cm ³ /1000 strokes 2	3	4	5	6	7	8	9	
1080	112,0-114,0 (110,0-116,0)	1130-1145*	-	-	100	15,0-15,5 mmRW			

Checking values in brackets

* 1 mm less control rod travel than col 2

5.81

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D24

D24

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4
2. Edition

En

PE 8 P 110 A 920 RS 339

RQV 200-1050 PA324R, 325R

supersedes

12.76

company:

Rolls Royce

engine:

C 8 T
C 8 M

1 - 6 - 2 - 5 - 8 - 3 - 7 - 4 ± 0,50
0 -45 -90-135-180-225-270-315° (± 0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{2,50-2,60}{(2,45-2,65)}$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12,0 + 0,1	11,7 - 11,9	0,4(0,8)			
200	8,5-8,7	1,6 - 2,2	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

200-1050

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca .68	1050 1250	15,2-17,8 0 - 1	-	-	-	ca .12	100 200	min.7,5 5,9-6,1	200 1070	0,6-1,6 8,3
ca .66	11,0 4,0	1050-1055 1120-1150				3a	520-580= 700 2,0 0 - 1			

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery Idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1000	117,0-119,0 (114,0-122,0)	1050-1055*			100	15 - 16mmRW		./.

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.79

Testoil-ISO 4113

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B) Governor Settings RQV ..

-2-

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel Torque-control travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11

200-750 PA324R, 325R

ca.68	755	15,0-18,0	-	-	-	ca.12	100	5,4-8,2	755	8,3
	800	7,0-12,3					250	3,2-4,4		
	830	0 - 8					400	1,2-2,5		
	880	0					500	0	-	-

200-900 PA324R, 325R

ca.68	920	15,0-18,4	-	-	-	ca.12	150	5,7-8,0	915	8,3
	950	10,4-14,6					250	3,1-5,3		
	1020	0 - 6,8					400	1,8-3,5		
	1080	0					590	0		

Testoil-ISO 4113

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Test Specifications Fuel Injection Pumps ① and Governors

VDT-WPP 001/4

2. Edition

En

PES 6 P 110 A 320 RS 317 RQV 375-1100 PA 247 KR
RQV 375-1100 PA 200 KR ./.

supersedes -
company: Allis Chalmers
engine: Typ: 11 000

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

(+ 0,15)
(- 0,05)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	16,1 - 16,8	0,7			
600	9	8,4 - 9,6				
600	12	15,1 - 16,6				
600	15	21,3 - 23,2				
200	9	6,8 - 8,0				

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

RQV ... 247 KR

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca .66	1130 1200 1300 1390	15,0-17,6 9,0-13,5 0 - 7 0	-	-	-	ca .20	300 400 600 850	9,6-12,7 4,8- 6,4 2,8- 4,1 0	300 400 800 1130 1300 1390	0 - 1,4 2,8-3,4 5,0-5,4 8,3 end (11)

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) rev/min 1		Rotational-speed limitation intermediate speed rev/min 3		Fuel delivery characteristics high idle speed rev/min 4		Starting fuel delivery idle switching point rev/min 6		Torque-control travel rev/min 8	
cm ³ /1000 strokes 2	cm ³ /1000 strokes 5	cm ³ /1000 strokes 4a	cm ³ /1000 strokes 5b	cm ³ /1000 strokes 7	cm ³ /1000 strokes 9	cm ³ /1000 strokes 6	cm ³ /1000 strokes 7	Control rod travel mm 9	Control rod travel mm 9
LDA 1090	0,6 bar 138,0-140,0	1140-1150*	LDA 600	0,6 bar 151,0-157,0	LDA 600	100 375 300	80,0-120,0 8,0- 18,0 118,0-128,0		

Change-over point 200-300 U/min.

Checking values in brackets

* 1 mm less control rod travel than col. 2

10.75

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Testoil-ISO 4113

B. Governor Settings

375-1100 PA 200 KR

317 / 200 KR -2-

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca .66	1100 1150 1200 1250 1360	15,0-18,0 11,0-15,0 6,6-11,8 1,8- 8,6 0	-	-	-	ca .15	200 300 400 600 850	12,0-15,0 8,4-11,6 5,0- 6,8 3,1- 4,4 0	370 900 1270 -1360 -	3,0-3,6 6,0-6,5 end (11) -
						(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed	Starting fuel delivery idle switching point	Torque-control travel
rev/min	cm ³ /1000 strokes	rev/min	rev/min	rev/min	rev/min
1	2	3	4	6	8
1090	138,0-140,0	1140-1150*	600	151,0-157,0	100
					370
					300
					Change-over point 180-230 min ⁻¹
					80,0-120,0
					8,0- 18,0
					89,0- 99,0

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n = rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm
317 / 247 KR	0,12	0,41	-2,1-2,2 mm -0,2-0,4 mm

En

600

0,6

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps ① and Governors

VDT-WPP 001/4

1. Edition

En

PES 6 P 110 A 320 RS 318

RQV 300-1025 PA 173 KR

supersedes -

300-1000 PA 217 KR

company: Allis Chalmers

300-1000 PA 294 KR ./.

engine: 11 000

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

2,8 + 0,1

mm (from BDC)

 $\begin{pmatrix} + 0,15 \\ - 0,05 \end{pmatrix}$

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	15,4-16,1	0,6			
600	15	21,1-22,8				
400	9	7,0- 8,2				

Adjust the fuel delivery from each outlet according to the values in .

RQV 300-1025 PA 173 KR

RQV 300-1000 PA 217 KR

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 66	1050 1100 1150 1200 1300	15,0-18,0 10,8-15,0 5,8-11,6 0,7- 7,8 0	-	-	-	ca. 10	250 300 350 400 550	6,4-8,0 4,8-7,0 3,0-5,2 2,2-3,8 0	380 550 1000	1,8-2,6 3,8-4,6 7,5-7,9

Torque control travel a =

mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery Idle switching point ⑥	Torque-control travel ⑤		
rev/min	cm³/1000 strokes	rev/min ④a	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
318 /	173KR:				100	80,0-120,0		
1015	89,0 - 91,0	1145-1155*	700	96,0-100,0	300	19,0- 23,0		
318 /	217 KR:				Change-over point 150-250 min⁻¹			
1000	135,0-137,0	1030-1050*	700	123,0-127,0				./.

Checking values in brackets

* 1 mm less control rod travel than col. 2

10,75

Testoil-ISO 4113

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B. Governor Settings

Upper rated speed			intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca .66	1050 1100 1150 1200 1300	15,0-18,0 10,8-15,0 5,8-11,6 0,7- 7,8 0	-	-	-	ca .10	250 300 350 400 550	6,4-8,0 4,8-7,0 3,0-5,2 2,2-3,8 0	380 550 1000	1,8-2,6 3,8-4,6 7,5-7,9
						3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA 1000	1,1 bar 135,0-137,0	1030-1040*	LDA 500	1,1 bar 131,5-135,5	100 300	80,0-120,0 19,0- 23,0		
			LDA 500	0 bar 75,5- 83,5	Change-over point 150-250 min ⁻¹			

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure CompensatorTest at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing pressure - in bar gauge pressure
XXXXXX

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm
318 / 294 KR	0,75 - 0,80	0,19 - 0,26	- 0,1 mm - 2,3 mm
<hr/>			

En

500

1,1

Testoil-ISO 4113

①

Test Specifications Fuel Injection Pumps ① and Governors

40

WPP 001/4

1. Edition

En

PES 6 P 110 A 720 RS 352

RQV 300/600 - 1050 PA 358 KR

... PA 359 KR

supersedes -

company: Mack

engine: ET 673
(260 HP)

358 KR = Dimension B

359 KR = Dimension PLE - .685-745 inch - see pag.2!

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,8 + 0,1$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12,0	15,8 - 16,4	0,4			
300	6,0	0,7 - 2,7				

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

B. Governor Settings

...358 KR

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca .68	1050	16,4-18,8	-	-	-	ca .19	250	9,8-11,5	300	0,8-2,1
	1150	4,2-10,0					400	2,2- 5,2	400-550	2,9-4,4
	1200	0 - 5,6					700	0,8- 2,0	900	5,8-6,2
	1260	0					830	0	1000	7,9

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed	Fuel delivery characteristics		Starting fuel delivery		Torque-control	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1050	171,0-173,0	1090-1100*	750	166,0-170,0	100	110,0-170,0	1050	12,5
			500	132,0-138,0	300	19,0- 39,0	750	12,7
					1155	29,0- 59,0	500	11,5

Checking values in brackets

* 1 mm less control rod travel than col. 2

4.77

E10

E10

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B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca .68	1050	16,4-18,8	-	-	-	ca .19	250	9,8-11,5	300	0,8-2,1
	1150	4,2-10,0					400	2,2-5,2	400-550	
	1200	0 - 5,6					700	0,8-2,0	900	2,9-4,4
	1260	0					830	0	1050	5,8-6,2 7,9

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery Idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	
1050	173,0-175,0	1090-1100*	750	168,0-172,0	100	110,0-170,0	1050	12,5	
			500	134,0-140,0	300	19,0- 39,0	750	12,8	
			PLE		1155	29,0- 59,0	500	11,5	
			300	99-119					

Checking values in brackets

* 1 mm less control rod travel than col 2

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery Idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min		rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	

Checking values in brackets

* 1 mm less control rod travel than col 2

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 19,1 i 1

2. Edition

En

PE 12 P 110 A 320 LS 830

RQ 1050 PA 374 R (1)

RQ 1050 PA 310 (2)

supersedes 10.79

company: Daimler-Benz

engine: OM 404 A

12 - 1 - 5 - 9 - 8 - 3 - 4 - 11 - 10 - 2 - 6 - 7 (± 0,50)

0 -45 -60 -105-120-165-180-225 -240-285-300-345 (± 0,75)

336 kW(457PS) (1)

407 kW(553PS) (2)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

3,20-3,30

Cyl. 12

Port closing at prestroke

(3,15-3,35)

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12,9-13,0	14,0-14,2	0,4(0,8)			
300	7,3-7,5	1,1- 1,7	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

B. Governor Settings

PA 374

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
	11,9 6,0 0-1	1055-1066 1095-1105 1200								

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1000	140,0-142,0 (137,0-145,0)	1055-1066*			100	110,0-130,0		

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.80

B. Governor Settings

PA 310

MB 19,1 i 1

-2-

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
	12,7 5,9 0-1	1055-1060 1095-1105 1200								
						3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1000	155,0-157,0 (152,0-160,0)	1055-1060*			100	110,0-130,0		

Checking values in brackets

* 1 mm less control rod travel than col. 2

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
						3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

①

Test Specifications Fuel Injection Pumps ① and Governors

VDT-WPP 001/4 MB 19,1 a

3. Edition

40

En

PE 12 P 100 A 320 LS 812 RQV 350-1250 PA 182 R (1)
LS 820 PA 251 R (2)
350-1100 PA 280 R (3)
12 - 1 - 5 - 9 - 8 - 3 - 4 - 11 - 10 - 2 - 6 - 7 (+0,5)
0 -45 -60 -105-120-165-180-225-240-285-300-345° (-0,75)

supersedes 10.74
company: Daimler-Benz
OM 404
engine: (1-430 PS)
(2-320/430 PS)
(3-350 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,4+0,1 mm (from BDC) Cyl. 12 (+ 0,15)
- 0,05

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	11,7 - 12,4	0,5			
600	9	5,0 - 6,2				
600	15	15,3 - 17,0				
200	9	3,5 - 4,5				

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

350-1250 PA 182 (1)

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1265 1320 1400 1520	15,0-18,0 10,2-14,8 2,5- 9,5 0	-	-	-	ca. 17	200 350 600 900	8,7-11,0 5,7- 7,9 3,0- 4,5 0	1285	8,3
						3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
(1) 1240	110,0-112,0 (108,0-114,0)	1285-1295*		1365-1385:4,5 dispersion max. 6 cm ³ Charge-over point	100	11 - 13		
						200-250 U/min		

Checking values in brackets

* 1 mm less control rod travel than col. 2

6.75

Testoil-ISO 4113

B. Governor Settings

350-1250 PA 251 (2) VDT-WPP 001/4 MB 19,1 a

-2-

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 68	1265 1320 1400 1520	15,0-18,0 10,2-14,8 2,5- 9,5 0	-	-	-	ca. 17	200 350 600 900	8,7-11,0 5,7- 7,9 3,0- 4,5 0	1285	8,3
						(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1240	110,0-112,0 (108,0-114,0)	1285-1295*	1240	74,0-76,0** (72,0-78,0) 1365-1385: 4,5 mm _{RW} dispersion max. 6 cm ³ Change-over point	100	11 - 13		

Checking values in brackets

** Set reduced delivery (75% standard) at reduced-delivery lever!
With 85%-89.0-91.0 cm³ or 60%-59.0-61.0 cm³, this must be marked on the nameplate or indicated by DB.

* 1 mm less control rod travel than col. 2

B. Governor Settings

RQV ..280R (3)

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 68	1150 1180 1250 1330	15,0-18,4 9,0-14,0 0 - 7,6 0	-	-	-	ca. 12	230 350 500 740	7,1-8,2 5,4-6,7 1,8-3,7 0	1130	8,3
						(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
(3)	96,0 - 98,0 (94,0 - 100,0)	1130-1140*		1180-1200: 4,4 mm _{RW} dispersion max. 6 cm ³ Change-over point	100	11 - 13		

Checking values in brackets

* 1 mm less control rod travel than col. 2

En

Testoil-ISO 4113

①

Test Specifications Fuel Injection Pumps ① and Governors

VDT-WPP 001/4

40

4. Edition

En

PES 8 P 110 A 321 RS 283, Z RQV 250-1150 PA 254 R
RS 283 RQV 250-1150 PA 255 DR ./.

supersedes 1.75
company: Berliet
engine: V 835

Cam sequence and angular cam spring
1 - 8 - 4 - 2 - 7 - 3 - 6 - 5 je 45° (+ 0,5
- 0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Cyl. 5 (+0,15
-0,05)

Port closing at prestroke 2,8 + 0,1 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	12,8 - 13,5	0,5			
600	9 15	6,6 - 7,7 17,5 - 19,5				
200	9	4,6 - 5,8				

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

B. Governor Settings

RQV .. PA 254

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1170 1220 1300 1420	15,0-18,2 10,2-14,5 1,8-11,0 0	-	-	-	ca. 12	100 250 420 600 710	6,1-8,0 4,9-6,7 2,0-3,9 0,3-1,8 0	1190	8,3
						3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ④a	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥	Torque-control ⑤		
rev/min	cm³/1000 strokes	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
283: 1150	109,0-111,0 (106,0-114,0)	1185-1195*			100	120 - 150		
283Z: 1150	102,5-104,5 (99,5-107,5)	1190-1200*			250	15 - 21		
						Change-over point 130-200 U/min		

Checking values in brackets

* 1 mm less control rod travel than col. 2

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1.76

E16

E16

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca .68	1170 1220 1300 1420	15,0-18,2 10,2-14,5 1,8-11,0 0	-	-	-	ca .12	100 250 420 600 710	6,1-8,0 4,9-6,7 2,0-3,9 0,3-1,8 0	1190 1150 500	8,3 0 1,0-1,2
						(3a)				

Torque control travel a = 1,1 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery Idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1150	97,0 - 99,0	1185-1195*	1000 750 500	99,5-102,5 103,0-107,0 96,0-102,0	100 250	110 - 150 15 - 21		
(increase by ± 3,0 cm ³ !)					Change-over point 130-200 U/min			

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
						(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery Idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9

Checking values in brackets

* 1 mm less control rod travel than col. 2

①

Test Specifications Fuel Injection Pumps ① and Governors

40

WPP 001/4 MB 19,1 f

4. Edition

En

PE 12 P 100 A 320 LS 828 RQ 750 PA 374 R

12- 1- 5- 9- 8- 3- 4- 11- 10- 2- 6- 7 ± 0,50
0 -45-60-105-120-165-180-225-240-285-300- (0,75)
345

supersedes 2.80
company: Daimler-Benz
engine: OM 404
205 kW (279 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,20-3,30 mm (from BDC) Cyl. 12
(3,15-3,35)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
730	11,3-11,4	8,7 - 8,9	0,3(0,6)			
300		1,2 - 1,8	0,3(0,5)			

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 28	10,3 5,3 850	750-755 780-790 0 - 1	-	-	-	-	-	-	750	3,8

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) (2)		Rotational-speed limitation intermediate speed (2b) (4a)	Fuel delivery characteristics high idle speed (5a) (5b)		Starting fuel delivery Idle switching point (6)		Torque-control travel (5) Control rod travel mm	
rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	mm 9
730	87,0-89,0 (85,0-91,0)	750-755*			100 100	15,0-15,5 (80)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.81

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Test Specifications

Fuel Injection Pumps (1A)

and Governors

40

VDT-WPP 001/4

3. Edition

En

PE 6 P 100 A 320 RS 284 EP/RSV 300-1100 P1/808D
300-1100 P1/811D ./.

supersedes 4.74, 12.74
company Berliet
engine MS 635 T

Manifold-pressure compensator adjustment see page 2!

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,0 + 0,1 mm (from BDC)

Testoil-ISO 4113

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	10,5 - 11,2	0,6			
600	9	3,1 - 4,3				
	15	14,8 - 16,7				
200	9	1,8 - 3,0				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

EP/RSV .. 808 D

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca. 61	1100	16,0	without auxiliary spring			ca. 27	300	8,3	1080	0
	1150	11,6					100	19 - 21		
	1190	6,6					300	8,0-8,6	450	1,7-1,9
②a	1170	7,5-11,5	with auxiliary spring				500	1,5-5,0		
	1250	1,7- 4,4					660	0 - 1		
	1340	0,3- 1,0								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limit		③a Fuel delivery characteristics		Starting fuel delivery ⑤		④a Idle stop	
Test oil temp 40°C (104°F)		Note changed to)							
rev/min 1	cm ³ /1000 strokes 2	rev/min 3		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
0,85	bar	0,85 bar		500	0,35 bar	100	min. 150		
1100	141,0-143,0	1160-1170		60	150,0-160,0				
900	154,0-158,0			350	bar	300	14,0-20,0		
650	164,0-170,0			1180-1200	113,0-117,0				
(increase by ± 2,0 cm ³ !)					20,0-26,0				

Checking values in brackets

* 1 mm less control rod travel than col 2

12.75

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The numbers denote the sequence of the tests

B. Governor Settings

EP/RSV .. 811D

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 59	1100 1150 1200	16,0 10,2 4,5	without auxiliary spring			ca. 25	300	8,1	1080	0
②a	1100 1160 1250	ca. 12,8 ca. 10,2 0,3-1,0				with auxiliary spring	150 300 500 680	19 - 21 7,8-8,4 1,3-4,7 0 - 1		

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery Idle		⑤ Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)							
rev/min	cm³/1000 strokes	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	
1100 900 650	0,85 bar 143,0-145,0 163,0-167,0 168,0-174,0	1160-1170	500 0 350	0,36 bar 154,0-164,0 bar 113,0-117,0	100 300	150-190 15- 23			
(increase by ± 2,0 cm³!)									

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
284 / 808DR	0,35-0,36	0,19-0,22	-0,1 -2,1
284 / 811DR	0,46-0,48	0,18-0,22	-0,1 -2,7

Notes:

(1) when n = 1100 rev/min and gauge pressure = 0,85 bar (= maximum full-load control rod travel)

En

Test Specifications Fuel Injection Pumps ①A and Governors

40

WPP 001/4 MB 9,6g

1. Edition

En

PE 6 P 100 A 320 LS805

EP/RSV 350-750 P.1/814R
350-900

supersedes -

company Daimler-Benz

engine OM 401

(1-81/90 kW - 110/122 PS)

(2-96/106kW - 130/144 PS)

6 - 3 - 5 - 2 - 4 - 1 $\pm 0,5$
0 -45 -120-165-240-285° ($\pm 0,75$)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

** Set idle-speed auxiliary spring at 2.0 mm control-rod travel, then 1/2 turn back.

Port closing at prestroke 3,40-3,50
(3,35-3,55) mm (from BDC) cy1.6

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	11,7-12,4	0,4			
600	9 15	5,0 - 6,2 15,3-17,0				
200	9	3,5- 4,5				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca. 44	750 800 850	16,0 11,8 6,2	without auxiliary spring			ca. 25	350	5,3		**
②a	750 790 850	ca. 10,0 ca. 4,5 0,3-1,0					100 350 450	19 - 21 5,5-6,1 0 - 1		

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat		③a Fuel delivery characteristics		Starting fuel delivery Idle		④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to) rev/min							
rev/min 1	cm ³ /1000 strokes 2	3	4	5	6	7	8	9	
730	79,0-81,0 (77,0-83,0)	750-760*				100 780- dispersion	110 - 130 795=4,5mmRW max. 6		

Checking values in brackets

* 1 mm less control rod travel than col 2
8.78

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Testoil-ISO 4113

B. Governor Settings

350 - 900

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			⑤ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 44	750 800 850	16,0 11,8 6,2	without auxiliary spring			ca. 25	350	5,8		**
							100	19 - 21		
							350	5,5-6,1		
ca. 47	880 945 1000	ca. 10,0 ca. 4,5 0,3-1,0					450	0 - 1		
②a										

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery ⑤ Idle		④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)							
rev/min	cm³/1000 strokes	rev/min		rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9
870	86,0-88,0 (84,0-90,0)	895-905*				100	110-130		
							935-950:4,5mm RW dispersion max. 6		

Checking values in brackets

* 1 mm less control rod travel than col. 2

B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
②a										

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery ⑤ Idle		④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)							
rev/min	cm³/1000 strokes	rev/min		rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps 1A and Governors

40

VDT-WPP 001/4

2. Edition

En

PE 5 P 100 A 321 RS 274 EP/RSV 250-1200 P1/376DR
PE 6 P 100 A 321 RS 275 EP/RSV 250-1200 P1/376DR
250-1200 P1/393 R
300-1200 P2/403 R

supersedes 10.74
company Berliet
engine MJ 520
MJ 620

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC) RW 9 (+0,15 - -0,05)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	9,2 - 9,9	0,4			
600	9 15	2,1 - 3,1 13,4 - 15,0				
200	9	0,6 - 1,8				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

..376DR

1 Upper rated speed rev/min Degree of deflection of control lever 1			Intermediate rated speed 4 5 6			4 Lower rated speed Control-lever deflection in degrees rev/min 7 8 9			3 Torque control rev/min Control rod travel 10 11	
ca. 63	Control rod travel mm 2	Control rod travel mm rev/min 3				ca. 24	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
	1200	16,0	without auxiliary spring				250	8,5	1180	0
	1250	10,3					100	19 - 21		
	1270	7,0					250	8,2-8,8		
	1250	8,3-11,4	with auxiliary spring				400	4,4-6,4	350	1,4-1,6
	1300	4,0- 6,1					650	0 - 1		
	1420	0,3- 1,0								

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop Test oil temp. 40°C (104°F) rev/min 1		6 Rotational-speed limit Note: changed to .) rev/min 3		3a Fuel delivery characteristics rev/min cm ³ /1000 strokes 4 5		Starting fuel delivery Idle rev/min cm ³ /1000 strokes 6 7		4a Idle stop rev/min Control rod travel mm 8 9	
5, 6	Cyl.								
1200	88,0-90,0 (87,0-91,0)	1230-1250*				100	140-170		
						250	11- 17		

Checking values in brackets

* 1 mm less control rod travel than col 2

5.77

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Testoil-ISO 4113

B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca. 63	1200	16,0	without auxiliary spring			ca. 23	250	8,5	1180	0
	1270	7,3					100	19 - 21	300	1,2-1,8
	1300	2,8					250	8,2-8,8		
	1250	8,5-11,1	400	2,2-4,4						
	1300	3,5- 5,2	600	0 - 1						
②a	1420	0,3- 1,0	with auxiliary spring							

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery ⑤ Idle		④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)							
rev/min 1	cm ³ /1000 strokes 2	rev/min 3		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1200	95,5-97,5	1260-1270*				100	140-170		
						250	11-17		

Checking values in brackets

* 1 mm less control rod travel than col. 2

B. Governor Settings

275 / 403 R

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
ca. 54	1200	16,0	without auxiliary spring			ca. 25	300	8,9	1200	0
	1300	10,3					100	19 - 21		
	1350	7,2					300	8,6-9,2		
ca. 52	1200	ca. 11,7	with auxiliary spring				450	3,5-6,0		
	1300	ca. 7,1					650	0 - 1		
	1430	0,3-1,0								

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery ⑤ Idle		④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)							
rev/min 1	cm ³ /1000 strokes 2	rev/min 3		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1200	95,0-97,0	1250-70*				100	145 - 180		
						300	6 - 12		

Checking values in brackets

* 1 mm less control rod travel than col. 2

①

Test Specifications Fuel Injection Pumps ① and Governors

VDT-WPP 001/4 VOL 10,0b3

40

1. Edition

En

NP - PE 6 P 100 A 320 RS 319 NP - RQV 250-1100 PA 307/2 R

supersedes -

company: Voivo

engine: TD 100 A

Port-closing test with/without ROBO diaphragm

** In the case of greater dispersion alter the delivery-valve spring pre-tension accordingly.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,6±0,1 mm (from BDC) (+0,15)
(-0,05)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	12,7 - 13,4	0,5			2,5±0,1** (max 2,2-2,9)
600	9	6,1 - 7,3				
	12	11,3 - 12,7				
	15	16,5 - 18,2				
200	9	4,2 - 5,2				

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

RQV .. PA 307/2R

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 50	1170	15,0-18,3				ca. 13	100	8,9-11,0	1170	8,5
	1400	0					200	7,2- 9,9		
ca. 45	1100	15,1-17,9					300	4,0- 6,9		
	1180	8,2-13,3					380	0 - 3,4		
	1260	0 - 7,8					490	0		
	1360	0				3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational speed limitation intermediate speed	Fuel delivery characteristics high idle speed	Starting fuel delivery Idle switching point	Torque-control	Control rod travel
rev/min	cm ³ /1000 strokes	rev/min	rev/min	rev/min	rev/min	mm
1	2	3	4	6	8	9
LDA	0,5 bar		LDA	100		
700	145,0-148,0 (143,0-150,0)	1140-1150*	700	ca. 240,0 250 11 - 15 dispersion max. 2,5)**	2,5
						./.

Checking values in brackets

* 1 mm less control rod travel than col. 2

7.76

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Testoil-ISO 4113

F15

FAS

D. Adjustment Test for Manifold Pressure Compensator

-2-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
 increasing

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
319 / 307	0,24 - 0,27	0,07 - 0,12	-

Notes:

(1) when n = 700 rev/min and gauge pressure = 0,5 bar (= maximum full-load control rod travel)

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps ① and Governors

VDT-WPP 001/4

2. Edition

En

PES 8 P 100 A 921/5 RS 286

RQV 325-1250 PA 274 KR

supersedes -

company:

I H C - U S A

engine:

DVT 800

1 - 8 - 4 - 2 - 7 - 3 - 6 - 5 je 45°

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

2,8+0,1

mm (from BDC)

(+0,15
-0,05)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	11,4 - 12,0	0,4			
600	15	16,2 - 17,8				
200	6	2,9 - 3,9				

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

B. Governor Settings

RQV .. 274 K

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 66	1320 1400 1500 1650	15,0-18,0 9,8-14,0 1,9- 8,6 0	-	-	-	ca. 10	150 250 400 670	6,6-8,0 5,2-7,2 2,3-3,8 0	250 500 1000 1320 1520- 1640	0,4-1,4 3,4-3,8 5,6-6,0 8,3 End (11)

Torque control travel a =

mm

Sect. C, col. 8!

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational speed ②b limitation intermediate speed rev/min ④a	Fuel delivery characteristics ⑤a high idle speed ⑤b rev/min cm ³ /1000 strokes		Starting fuel delivery Idle switching point ⑥ rev/min cm ³ /1000 strokes		Torque-control ⑤ travel Control rod travel mm rev/min	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	mm 9
LDA 1250	1,0 bar 75,0-77,0	1300-1310*	LDA 900	1,0 bar 92,0-96,0	100	190 - 230	1250	9,4
			LDA 400	0 bar 22,0-28,0	325	8 - 11	900 400	10,1 6,6
					Change-over point 170-270 U/min			

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.75

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D. Adjustment Test for Manifold Pressure Compensator

Ppe 286 -2-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
286 / 274KR	0,15 - 0,26	0,81 - 0,85	Induction control-rod travel + 0.1 Boost control- rod travel -0.1

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Control-rod travel for induction and with charge-air pressure must be read off following full-load adjustment!

Testoil-ISO 4113

①

Test Specifications Fuel Injection Pumps ① and Governors

40

WPP 001/4 MB 12,8 a 1

1. Edition

En

PE 8 P 100 A 320 LS807 RQV 300-1250 PA 172DR

PE 8 P 100 A 320 LS813 EP/RSV 400-1100P 1/807R

8 - 7 - 2 - 6 - 3 - 5 - 4 - 1 $\pm 0,50$ 0 -45 -90 -135-180-225-270-315° ($\pm 0,75$)

supersedes 12,8a - 5,74

company: Daimler-Benz

engine: OM 402

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $2,80-2,90$ mm (from BDC) Cyl. 8
($2,75-2,95$)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	8,1 - 8,8	0,4			
600	9	2,7 - 3,7				
600	12	6,3 - 7,5				
600	15	10,9 - 12,4				
200	9	0,5 - 1,4				

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

PA 172 DR

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1230 1300 1340 1410	16,0-19,2 6,0-12,4 0 - 9 0	-	-	-	ca. 12	150 300 450 680	7,2-8,1 4,6-6,7 1,5-2,9 0	300 800 1250	0,4-1,5 4,4-4,8 8,2
						③a				

Torque control travel a = 0 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ④a	Fuel delivery characteristics ⑤a high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1250	95,0-97,0 (93,0-99,0)	1290-1310*	600	75,0 - 80,0 (73,0 - 82,0)	100	140,0-160,0		
						250-180 (270-160)		. / .

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.78

Testoil-ISO 4113

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F21

F21

B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 63	1100 1150 1200	16,0 12,0 6,7	without auxiliary spring			ca. 29	400	7,0	1080	0
ca. 61	1110 1200 1260	ca. 12,0 ca. 4,0 0,3-1,0					200 400 500 620	19 - 21 6,7-7,3 2,0-4,3 0 - 1	450	0,9-1,1
②a										

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery ⑤ Idle		④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)							
rev/min	cm³/1000 strokes	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm	
1	2	3	4	5	6	7	8	9	
1080	83,0-85,0 (81,0-87,0)	1120-1130*	700 500	78,0 - 81,0 (76,0 - 83,0) 77,5 - 80,5 (75,5 - 82,5)	100 1170-1190=	110,0-130,0 (108,0-132,0) 5 mm RW dispersion max. 6			

Checking values in brackets

* 1 mm less control rod travel than col. 2

B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
②a										

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery ⑤ Idle		④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)							
rev/min	cm³/1000 strokes	rev/min	rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm	
1	2	3	4	5	6	7	8	9	

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 SCA 11,0 k

40

3. Edition

En

PE 6 P 90/720 RS 148, 204 RQV 250-1100 PA47R, 169 R
RS 148, 204 EP/RSV 350-1100 P 1/310 R

supersedes 7.71
company: Scania
engine: D 11

Port-closing test with/without ROBO diaphragm

** In the case of greater dispersion alter the delivery-valve spring pre-tension accordingly.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,6 + 0,1 mm (from BDC) (+0,15) (-0,05)						
Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	8,5 - 9,2	0,4			2,5 ± 0,1** (max. 2,2-2,9)
600	9	2,9 - 3,9				
	12	7,4 - 8,4				
	15	12,2 - 13,5				
200	9	1,8 - 2,8				

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

B. Governor Settings

RQV .. 47R, 169 R

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm/rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1150	15,0-18,2				ca. 10	200	5,8-8,0	250	0,7-1,7
	1360	0 - 1,5					300	3,1-4,4	400	2,2-2,6
ca. 62	1100	15,0-17,8					450	2,2-3,5	1150	8,3
	1180	7,3-11,4					600	0,8-2,0		
	1250	0 - 5,6					740	0		
	1320	0								

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational speed limitation intermediate speed ②b		Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4a	rev/min 5	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1080	142,0-144,0 (140,0-146,0)	1120		600	135,0-139,0 133,0-141,0	100	190-240		
						225	9-11 dispersion max. 1,5		
						1200	16 - 22 dispersion max. 4		

Checking values in brackets

* 1 mm less control rod travel than col. 2
12.76

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B. Governor Settings

EP/RSV ..310R

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 67	1100	16,0	without auxiliary spring			ca. 31	350	6,0		max.
	1150	11,7					100	19 - 21		
	1200	6,0					350	5,7-6,3		
	1150	10,4-12,5	400	3,2-4,7						
②a	1200	4,4- 7,8	with auxiliary spring			550	1 - 1			
	1350	0,3- 1,0								

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery		⑤ Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)				Idle			
rev/min	cm³/1000 strokes	rev/min		rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9
1100	142,0-144,0 (140,0-146,0)	1120		600	135,0-139,0 (133,0-141,0)	100	190 - 240	350	6,0
						350	9 - 11	**	
						1200	16 - 22		
							dispersion max. 1,5		
							dispersion max. 4		

Checking values in brackets

* 1 mm less control rod travel than col. 2

B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Control-lever deflection in degrees		Lower rated speed		③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min						rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7		8	9	10	11
②a											

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery		⑤ Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)				Idle			
rev/min	cm³/1000 strokes	rev/min		rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9

Checking values in brackets

* 1 mm less control rod travel than col. 2

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MB 9,6 k **40**
3. Edition

En

PE 6 P 100 A 320 LS 805 RQ 1100 PA 440 R (1)

supersedes 10.80

company: Daimler-Benz

engine: OM 401

RSV 650-1200 P 1/820 (2)

6 - 3 - 5 - 2 - 4 - 1 $\pm 0,50^\circ$

(1) 116 kW (158 PS)

0 -45 -120-165-240-285° ($\pm 0,75^\circ$)

(2) 129 kW (175 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Cyl.6

Port closing at prestroke 3,40-3,50 mm (from BDC)
(3,35-3,55)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1050	10,4	10,0 - 10,2	0,3(0,6)	10,3	9,7 - 9,9	n = 1180
350	+0,1 7,8-8,0	2,3 - 2,8	0,3(0,5)	+ 0,1 5,8-6,0	0,7 - 1,3	n = 650

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

RQ .. 440 (1)

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
	9,4 4,2 1300	1120-1125 1160-1170 0 - 1	-	-	-	-	-	-	-	-
						3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ④a	Fuel delivery characteristics ⑤a high idle speed ⑤b		Starting fuel delivery Idle switching point ⑥		Torque-control ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1050	100,0-102,0 (98,0-104,0)	1120-1125*			100 - 1165	110,0-130,0 - 4,2 mm RW dispersion max.4(6)		./.

Checking values in brackets

* 1 mm less control rod travel than col. 2

2.82

Testoil-ISO 4113

BOSCH

Geschäftsbereich KH. Kundendienst. Kfz-Ausrüstung.
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G7

67

B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
loose	800	0,3-1,0				ca. 31	650	5,7		
	x =	4,3						650-720 = 2,0		
ca. 61	9,3	1215-1225								
	4,1	1245-1260								
	1340	0,3 - 1,7								
②a										

Speed difference between control-rod travel 1,0 mm and 4,0 mm = 25-35 min/1

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery ⑤ Idle		④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)							
rev/min	cm³/1000 strokes	rev/min		rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9
1180	97,0-99,0 (95,0-101,0)	1215-1255*				100	110 - 130		

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

B. Governor Settings

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
2a										

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery ⑤ Idle		④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)							
rev/min	cm³/1000 strokes	rev/min		rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MAN 11,1 L5
2. Edition

En

Testoil-SO 4113

PES 6 P 120 A 320 LS 403 RQV 250-1100 PA 488 (1)

superseded 2.80

company: MAN

engine: D 2566 MKUL
235,4 Kw (320 Ps)

6 - 2 - 4 - 1 - 5 - 3
0 - 60- 120-180-240-300 \pm 0,50 (0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (2,95-3,15)
3,00-3,10 mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery (1) cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
750	14,0+0,1	22,0 - 22,4	0,5 (0,9)			
250	7,5-7,7	1,2 - 1,8	0,8 (1,2)			
1100/650/500	0/500	C, 4-5	0,6(1,0)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed				Intermediate rated speed				Lower rated speed				Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	①a	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	④	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	③	rev/min 10	mm 11
max.	1100 1400	15,2-17,8 0 - 1,0		-	-	-		ca. 15	100 250	min. 9,1 7,5-7,7		250 500	1,0 3,4-3,6
ca. 68	11,5 4,0	1140-1150 1225-1255						360-495 ③a				1150	7,8

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 750	1,0 bar 220,0-224,0 (217,0-227,0)	1140-1150*	LDA 650	1,0 bar 212,0-218,0	100	215,0-235,0	1100	12,5+0,1
LDA 1100	1,0 bar 185,0-191,0 (182,0-194,0)		LDA 500	0,29 bar 138,0-144,0			1000	13,1+0,3
			LDA 500	0 bar 115,0-119,0			925	13,6+0,1
							750	14,0+0,1
Check values								

Checking values in brackets

Page 2

* 1 mm less control rod travel than col 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
403 / 488	1,0	0,58 0,29 0	14,0- 14,1 13,4- 13,7 11,7- 11,8 10,8- 10,9

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Check value - Fuel-delivery characteristics

LDA 1,0 bar
650 1/min (209,0 - 221,0)
LDA 0,29 bar
500 1/min (135,0 - 147,0)
LDA 0 bar
500 1/min (112,0 - 122,0)

Test Specifications

Distributor-type

Fuel-injection Pumps

WPP 001/4 FOR 3,5 a

1. Edition

En

VE 6/10 F 1800 R 11

0 460 406 002

Overflow temperature 45° C

supersedes

company:

engine:

Ford

CTD 216

All test specifications are valid only for Bosch Fuel-Injection Pump Test Benches and Testers

Test Instructions and Test Equipment

Pre-stroke setting

--

mm

see VDT-W-460/..

Testoil-ISO 4113

1. Settings	Rot. speed rev/min	Settings	Charge-air press. bar (kgf/cm ²)	Difference in delivery cm ³
1.1 Timing device travel	1600	4,9-5,3 mm		
1.2 Supply-pump pressure	1600	6,1-6,6 bar (kgf/cm ²)		
1.3 Full-load delivery with charge-air pressure	1750	37,0-38,0 cm ³ /1000 strokes		2,5(3,0)
Full-load delivery without charge-air pressure	--	-- cm ³ /1000 strokes		
1.4 Idle regulation	300	16,0-20,0 cm ³ /1000 strokes		2,5(3,0)
1.5 Full-speed regulation	100	min. 70,0 cm ³ /1000 strokes		
1.6 Start	2000	10,0-16,0 cm ³ /1000 strokes		
1.7 Load-dependent port-closing	--	--		

2. Test Specifications

checking values in brackets ()

2.1 Timing device	n = rev/min mm	1000 1,7-2,7(1,5-2,9)	1600 (4,4-5,8)	1800 5,4-6,1(5,0-6,4)
2.2 Supply pump	n = rev/min bar (kgf/cm ²)	1000 4,2-4,8		1800 6,7-7,2
Overflow delivery	n = rev/min cm ³ /10 s	500 55-111(40-126)		1800 55-111(40-126)

2.3 Fuel deliveries

Speed control lever	Rot. speed rev/min	Fuel delivery cm ³ /1000 strokes	Charge-air press. bar (kgf/cm ²)
End stop	2100-2200 2000 1900 1750 1250 800 285	0 (9,0-17,0) 28,0-34,0 (27,0-35,0) (35,2-39,8) 42,0-44,0 (40,7-45,3) 36,5-39,5 (35,7-40,3) max. 35,0	
switch-off	1800	0	
Idle stop	460-530 300	0 (14,0-22,0)	
End stop	215	min. 70,0	
2.4 Solenoid	cut-in voltage 10 V rated voltage 12 V		

3. Dimensions

for assembly
and adjustment
mm

Designation	
K	3,2-3,4
KF	5,9-6,1
MS	2,0-2,2
SVS	max. 5,1
A	10,2± 2,5
B	10,3± 1,6

Observations

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Pump/engine assignment:

Adjustment by means of pointer and marker plate

Pointer setting with plunger lift 0.87 mm referenced to outlet "F"

Adjustment by means of notched plates

Setting of upper notched plate with plunger lift 0.22 mm referenced to outlet "F"

Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4 MAN 20,9h1

4. Edition

En

Testoil-ISO 4113

 PE 12 P 120 A 520 LS 843 RQ 900 PA 494 (1)
 RZU 750 P1/15R (2)

supersedes 4.80

company: MAN

 engine: D25 42 MLE
 384,0kW(522PS)(1)
 319,9kW(435PS)(2)

 12 - 1 - 5 - 9 - 8 - 3 - 4 - 11 - 10 - 2 - 6 - 7 + 0,50
 0 -45 -60 -105-120-165-180-225 -240 -285-300-345 (- 0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke $\frac{3,00-3,10}{(2,95-3,15)}$ mm (from BDC) Cyl. 12

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
850	10,8-10,9	17,6 - 18,0	0,5(0,8)	10,5-10,6	-	n 700
300	4,2-4,4	1,7 - 2,3	0,8(0,7)	-	1,7 - 2,3	250

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

RQ 900 PA 494 (1)

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
850	19,2-20,8	850	20,0	9,8	900-905					900	5,0
1000	0 - 1,0	VH ca.	49°	4,0	927-936						

Torque-control travel
on flyweight assembly dimension a =

mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery Idle speed	
②		③a		③b		⑥	
rev/min 1	cm ³ /-1000 strokes 2	rev/min 3		rev/min 4	cm ³ /-1000 strokes 5	rev/min 6	cm ³ /1000 strokes/mm Control rod travel 7
850	176,0 - 180,0 (173,0 - 183,0)					100	19,5-21,0 RW
						300	17,0-23,0

Checking values in brackets

B. Governor Settings

(2) RZU 750 P1/15R

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
	9,5 4,0 850	750 765-773 0-1								
						(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp: 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
700	10,5-10,6 mm RW	750*						

Checking values in brackets

* 1 mm less control rod travel than col. 2

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
						(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp: 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9

Checking values in brackets

* 1 mm less control rod travel than col. 2

Test Specifications Fuel Injection Pumps ② and Governors

Testoil-ISO 4113

PES 6 P 110 A 720 LS295

RQ 250/1100 PA422 DR

RQV 250-1100 PA421DR

supersedes 7.78

 company: MAN-Saviem
 engine: D 2566 MTSF
 (206 kW - 280 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

^{3,00-3,10}
 (2,95-3,15)

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	12,1	14,6 - 14,8	0,4(0,8)			
	+0,1					
250	6,8-7,0	0,9 - 1,5	0,4(0,7)			
700/500	- - -	C, 4-5	0,6(1,0)			

A: just the fuel delivery from each outlet according to the values in .

B. Governor Settings

RQ..422DR

Checking of slider PRG check		Full-load speed regulation				Idle speed regulation				Torque control	
①		Setting point		Test specifications		Setting point		Test specifications		③	
rev/min 1	Control rod travel mm 2	rev/min 3	Control rod travel mm 4	Control rod travel mm 5	rev/min 6	rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12 + 0,1
600	19,2-20,8	600	20,0	11,2	1145-1160	250	6,9	100	min. 8,5	1100	12,1
1100	Breakaway	VH ca.	49 ⁰	4,0	1200-1230			250	6,8-7,0	1000	12,4
								370	410 = 2,0	800	12,7
1300	0 - 1							440	0 - 1	700	12,8

Torque-control travel
on flyweight assembly dimension a = 0,3 mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F)		Control rod stop		Fuel delivery characteristics		Starting fuel delivery Idle speed	
②		③a		③b		⑥	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3		rev/min 4	cm ³ /1000 strokes 5	rev/min 6	Change-over point rev/min 7
LDA	0,7 bar			LDA	0,2 bar		
1100	146,0 - 148,0 (143,0 - 151,0)			500	123,0 - 127,0 (120,0 - 130,0)	100	215,0 - 235,0
700	157,0 - 161,0 (154,0 - 164,0)			LDA	0 bar		
					111,0 - 113,0 (108,0 - 116,0)	100-170 (80-190)	

Checking values in brackets

B. Governor Settings

MAN 11,102
RQV..421DR

- 2 -

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 68	1100 1400	15,2-17,8 0 - 1	-	-	-	ca. 16	100 250 520-580=2,0 700	min.8,5 6,9-7,1 0 - 1	250 300 1140	0,9-1,1 5,3-5,5 8,3
ca. 66	11,1 4,0	1140-1150 1245-1275				(3a)				

Torque control travel a = mm

see C, 8

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel + 0,1 Control rod travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	9
LDA 1100	0,7 bar 146,0-148,0 (143,0-151,0)	1140-1150 *	LDA 500	0,2 bar 123,0-127,0 (120,0-130,0)	100	215,0-235,0	1100	12,1
700	157,0-161,0 (154,0-164,0)		LDA 500	0 bar 111,0-113,0 (108,0-116,0)			850	12,4
					100-170 (80-190)		700	12,8

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n = rev/min decreasing pressure - in bar gauge pressure

Pump/governor	Setting	Measurement	Control rod travel-difference
	Gauge pressure = bar	Gauge pressure = bar	mm
295 / 421DR + 422DR	0,68	0,32 0,20 0	12,8 - 12,9 12,3 - 12,4 11,5 - 11,7 10,9 - 11,0

En

TEX/Pu

Test Specifications Fuel Injection Pumps ① and Governors

Testoil-ISO 4113

PE 12 P 100 A520/4 LS823 RQV 250-1200 PA 353R

supersedes

PE 12 P 100 A520/4 LS834 RQ 750 PA392R

company M A N

engine: D 2542 ME

12 - 1 - 5 - 9 - 8 - 3 - 4 - 11 - 10 - 2 - 6 - 7
 0 - 45 - 60 - 105 - 120 - 165 - 180 - 225 - 240 - 285 - 300 - 345⁰ (+0,50)
 (+0,75)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,10-3,20
(3,05-3,25)

mm (from BDC)

Cyl. 12

Rotational speed rev/min	Control rod travel mm	Fuel delivery "823" cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery "834" cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
1200	13,8 (+0,1)	10,8 - 11,0	0,3(0,6)	12,0 (+0,1)	9,1 - 9,3	n = 700
250	10,5 (+0,1)	1,8 - 2,4	0,3(0,5)	5,3-5,5	1,2 - 1,8	n = 300

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

RQV .. 353

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 68	1200 1500	15,2-17,8 0 - 1	-	-	-	ca. 11	100 250 490- 700	min. 7,5 5,9-6,1 550=2,0 0	200 800 1230	0,3-1,2 4,8-5,2 8,2
ca. 66	12,8 4,0	1240-1250 1355-1385				③a			-	-

Torque control travel a = - mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Torque-control	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
1200	108,0-110,0 (106,0-112,0)	1240-1250*			100	19,5-21,0 mm RW		./.

Checking values in brackets

* 1 mm less control rod travel than col. 2

B. Governor Settings

RQ..392R

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 30	11,0 3,7 900	750-755 770-780 0 - 1	-	-	-	-	-	-	750	5,3
						3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery Idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes mm RW	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
700	91,0 - 93,0 (89,0 - 95,0)	750-755*			100	19,5-21,0		
					775	8,6-8,8 dispersion max.4(6)		

Checking values in brackets

* 1 mm less control rod travel than col 2

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
						3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery Idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9

H2O Checking values in brackets

* 1 mm less control rod travel than col 2

①

Test Specifications Fuel Injection Pumps ① and Governors

40

WPP 001/4 MB 16,0 e 1

1. Edition

En

PE 10 P 100 A 320 LS 811

RQV 350-1250 PA 251R

PE 10 P 100 A 320 LS 821

RQV 350-1250 PA 182R

10 - 9 - 4 - 1 - 8 - 7 - 6 - 3 - 5 - 2 (± 0,50)

0 - 45- 72- 117-144-189-216-261-288-333° (± 0,75)

supersedes 16,0c -12.72

company: Daimler-Benz

engine: OM 403

206 kW (320 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,40-3,50 mm (from BDC) Cyl. 10
(3,34-3,55)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	11,7 - 12,4	0,4			
600	9	5,0 - 6,2				
600	15	15,3 - 17,0				
200	9	3,5 - 4,5				

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

251 R

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1265 1320 1400 1520	15,0-18,0 10,2-14,8 2,5- 9,5 0	-	-	-	ca. 17	200 350 600 900	8,7-11,0 5,7- 7,9 3,0- 4,5 0	1285	8,3
						3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ④a	Fuel delivery characteristics ⑤a high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
1230	98,0-100,0 (96,0-102,0)	1290-1305*	1230**	76,0-78,0 (74,0-80,0)	100	110-130		
					1360-1390:4 mm RW dispersion max. 6			
					200-250(180-270)			
							./.	

Checking values in brackets

* 1 mm less control rod travel than col. 2

1.78

Testoil-ISO 4113

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H23

H23

B. Governor Settings

182R

MB 16,0 e1

-2-

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca .68	1265 1320 1400 1520	15,0-18,0 10,2-14,8 2,5- 9,5 0	-	-	-	ca .17	200 350 600 900	8,7-11,0 5,7- 7,9 3,0-4,5 0	1285	8,3
						(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	
1230	98,0-100,0 (96,0-102,0)	1290-1305*				100	110,0-130,0 (108,0-132,0) 1360-1390:4mm RW dispersion max. 6 200-250(180-270)		

Checking values in brackets

* 1 mm less control rod travel than col 2

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
						(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed		Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	

Checking values in brackets

* 1 mm less control rod travel than col 2

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps ② and Governors

WPP 001/4

1. Edition

En

PE 6 P 100/820 LS 125 RQ 175/1000 PA 80 DR (1)

PE 6 P 100/820 LS 130 RQ 175/1000 PA 87 DR (2)

Test LDA (manifold-pressure compensator) in accordance
with W 420/304, page 8

Full-load values as indicated by Enasa

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

supersedes

company: Enasa

engine: D 9105 (1)

D 9109/1 (2)
(240 PS)

A. Fuel Injection Pump Settings

Port closing at prestroke $2,8 + 0,1$ mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	12,4 - 13,2				
600	15	17,3 - 19,0				
200	9	3,6 - 4,6				

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

RQ..80 DR (1)

Checking of slider PRG check rev/min 1		Full-load speed regulation Setting point rev/min 3		Test specifications Control rod travel mm 5 rev/min 6		Idle speed regulation Setting point rev/min 7 Control rod travel mm 8		Test specifications rev/min 9 Control rod travel mm 10		Torque control rev/min 11 Control rod travel mm 12	
450	15,7-16,3	450	16,0	1000	14,4-14,7	400	0	100	6,0-8,0	500	15,9-16,0
				1030	6,5-12,5			150	4,6-6,8	700	15,3-15,6
				1060	0 - 8,0			250	0 - 2,6	850	14,7-15,0
				1110	0			300	0		

Torque-control travel
on flyweight assembly dimension a = $0,4$ mm

Speed regulation: At

1 mm less control
rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp. 40°C (104°F) rev/min 1 cm ³ /1000 strokes 2		Control rod stop rev/min 3		Fuel delivery characteristics rev/min 4 cm ³ /1000 strokes 5		Starting fuel delivery Idle speed rev/min 6 cm ³ /1000 strokes/mm 7	
(1)							
ca. 10 mm RW - Adjust							
							./.

Checking values in brackets

10.77

B Governor Settings

RQ.. 87 DR (2)

Ppe 125/130

-2-

Checking of slider PRG check (1)		Full-load speed regulation (4)				Idle speed regulation (5)				Torque control (3)	
rev/min	Control rod travel mm	Setting point rev/min	Control rod travel mm	Test specifications Control rod travel mm	rev/min	Setting point rev/min	Control rod travel mm	Test specifications rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11	12
400	16,5-17,1	400	17,0	1030	15,0-15,5	400	0	175	6,0-8,0		
				1130	0			350	0		

Torque-control travel on flyweight assembly dimension a 0,4 mm

Speed regulation At

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp 40°C (104 F) (2)		Control rod stop (3a)		Fuel delivery characteristics (3b)		Starting fuel delivery Idle speed (6)	
rev/min	cm ³ /- 1000 strokes	rev/min		rev/min	cm ³ /- 1000 strokes	rev/min	cm ³ /1000 strokes / mm
1	2	3		4	5	6	7
(2) LDA 0,53 bar 700	167,0-169,0			LDA 700	0 bar 146,0-148,0		
LDA 1000	0,72 bar 157,0-161,0						

Checking values in brackets

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure bar	Gauge pressure bar	mm (1)
130 / 87 DR	0,24	---	---

Notes

(1) when n = rev/min and gauge pressure bar (--- maximum full-load control rod travel)

En

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps and Governors

VDT-WPP 001/4 VOL 6,0 d
3. Edition

En

PES 6 MW 100/320 RS 5 RWV 300-1400 MW 18
Cam sequence and angular cam spacing.

1-5-3-6-2-4 -0-60-120-180-240-300 $\pm 0,5^\circ (\pm 0,75^\circ)$

See page 2!

supersedes 7.77
company Volvo
engine D 60 A

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,5-2,6 mm (from BDC) 10,5 Control rod travel
(2,45-2,65)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (compensating valve) mm
1	2	3	4	2	3	6
1400	9,1 ($\pm 0,1$)	7,1 - 7,3	0,35(0,6)			
300	5,0 ($\pm 0,1$)	0,9 - 1,3	0,35(0,55)			
600		C, col.4-5	0,5(0,7)			

Set uniform delivery according to the values in

Checking values in brackets

B. Governor Settings

Lower rated speed			Upper rated speed			Variations in control rod travel		
Degree of deflection of control lever	Control rod travel mm	Rotational speed rev/min	Degree of deflection of control lever	Control rod travel mm	Rotational speed rev/min		Rotational speed rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
26	mind 9,5	100-150	82	9,1	1410		100	20,5-21,5
	5,0	290-310	± 4	8,1	1410-1450		1300	9,0- 9,2
	with contact	310		4,0	1500-1520		1200	9,1- 9,3
				max. 1,0	1550-1610		1050	9,7- 9,9
	0	500-550	40 ⁺⁵				Switching point	
							180-230 (170-240)	

C. Settings for Fuel Injection Pump with Governor Mounted

Full-load delivery		Full-load speed regulation	Variations in fuel delivery		Starting fuel delivery		Difference
Test oil temp 40°C (104°F)					Idle		
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	cm ³ /1000 strokes
1	2	3	4	5	6	7	8
1400	71,4-73,4 (69,4-75,4)	1440-1450* (1435-1455)	600	58,8-63,8 (57,8-65,8)	100	mind. 140	
					300	9,8-13,8 (7,3-16,3)	3,5 (5,5)

Checking values in brackets

($\pm 0,1$)

less control rod travel than in Column 2

5.82

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Testoil-ISO 4113

Note:

VOL 6.0 d

-2-

Sliding-sleeve idle travel 4.15 - 4.35 mm

En

①

Test Specifications Fuel Injection Pumps ① and Governors

40

WPP 001/4 VOL 7,0 f

3. Edition

En

PE 6 P 110 A 320 RS 367

RQV 250-1100 PA 435/2R(1)

supersedes

5.79

company:

Volvo

250-1200 PA 435 R(2)

engine:

TD 70 F

(1) 169 kW (230PS)
(2) 157 kW (213PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $\frac{3,00-3,10}{(2,95-3,15)}$ mm (from BDC) RW 10,5

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	10,7 +0,1	9,7 - 9,9	0,4(0,8)	10,8 +0,1	10,0-10,2	2,5 ± 0,1** (max. 2,2-2,9)
250	4,7-4,8	0,9 - 1,3	0,3(0,6)	4,7-4,8	0,9 - 1,3	
700	- --	C. 4-5	0,6(1,0)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

250-1100

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1100 1450	15,2-17,8 0 - 1	-	-	-	ca. 11	100 250 365-425= 2,0 700	min. 7,0 4,7-4,8 0 - 1	250 800 1150	1,6-1,8 4,9-5,3 7,7
ca. 65	9,7 4,0	1140-1150 1225-1255				(3a)				

Torque-control travel a = mm

** In the case of greater dispersion alter the delivery-valve spring pre-tension accordingly.

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA	0,7 bar 97,0-99,0 (94,0-102,0)	1140-1150*	LDA 700	0 bar 77,0-79,0 (74,0-82,0)	100 250	165,0-200,0 11,0- 15,0 dispersion max.3 (6)		./.

Checking values in brackets

* 1 mm less control rod travel than col. 2

10.80

Testoil-ISO 4113

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J7

J7

B. Governor Settings

250-1200

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca .68	1200 1450	15,2-17,8 0 - 1	-	-	-	ca .11	100 250	min.6,3 4,7-4,8		
ca .64	9,8 4,0	1240-1250 1320-1350				300-415 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery Idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA 700	0,7 bar 100,0-102,0 (97,0-105,0)	1240-1250*	LDA 700	0 bar 78,0-81,0 (75,0-84,0)	100 250	165,0-200,0 11,0- 15,0		

Checking values in brackets

* 1 mm less control rod travel than col: 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure

Pump/governor	Setting	Measurement	Control rod travel-diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm
367 / 250 (1100)	0,18	0,08	10,4 - 10,5 9,9 - 10,0
367 / 250(1200)	0,7	0,34 0,24 0	10,8 - 10,9 10,5 - 10,6 10,0 - 10,2 9,7 - 9,8

En

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps ① and Governors

En

PE 6 P 110 A 320 RS 229 RQV 250 - 1100 PA 403/2R
RS 229Z/RQV 250- 1100 PA 427/2R

supersedes 2.81
company: Volvo
engine: THD 100TD
177 kW(240PS)

** In the case of greater dispersion alter the delivery-valve spring pre-tension accordingly.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

(2,55-2,75)

Port closing at prestroke

2,60-2,70

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	11,4 +0,1	13,9 - 14,1	0,4(0,8)			2,5+0,1** (max.2,2-2,9)
250	6,1-6,2	1,4 - 1,8	0,3(0,7)			
700	- - -Sect. C, col. 4,5		0,6(1,0)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1100 1350	15,2-17,8 0 - 1				ca. 13	100 250 325-385=2,0	min. 9,0 6,0-6,1	200 500 800 1100	0,7-0,9 3,0-3,3 5,2-5,5 8,0
ca. 48	10,4 4,0	1160-1170 1240-1270				3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery Idle switching point ⑥		Torque-control ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 700	0,6 bar 139,0-141,0 (136,0-144,0)	1160-1170*	LDA 700	0 bar 112,5-115,5 (109,5-118,5)	100 250	290,0-340,0 16 - 20** dispersion max.3		

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

-2-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

VOL 10,0 h 2

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
229 / 403/2R 229Z / 427/2 R	0,33	0,25	11,1 - 11,2 10,4 - 10,5

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Testoil-ISO 4113

En

J22

J22

①

Test Specifications Fuel Injection Pumps ① and Governors

40

WPP 001/4 VOL 10,0h1

2. Edition

En

PE 6 P 110 A 320 RS 229

RQV 250-1000 PA 427 R

supersedes 10.79

company: Volvo

engine: THD 100 D
(176,5kW-250PS)1 - 5 - 3 - 6 - 2 - 4
0 -60 -120-180-240-300

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

2,60-2,70
(2,55-2,75)

mm (from BDC)

RW 10,5

Cyl. 1

Rotational speed	Control rod travel	Fuel delivery	Difference	Control rod travel	Fuel delivery	Spring pre-tensioning (torque-control valve)
rev/min	mm	cm ³ /100 strokes	cm ³ /100 strokes	mm	cm ³ /100 strokes	mm
1	2	3	4	2	3	6
700	11,4-11,6	13,9 - 14,1	0,4(0,8)			2,5 ± 0,1** max.2,2-2,9
250	6,0-6,1	0,9 - 1,3	0,3(0,7)			
700	-	C. 4-5				
** In the case of greater dispersion alter the delivery-valve spring pre-tension accordingly.						

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca .68	1050 1350	15,2-17,8 0,0- 1,0				ca .12	100 250	min.7,7 6,0-6,2	250 440	1,1-1,2 2,5-2,9
ca .44	10,4 4,0	1060-1070 1135-1165				(3a)	325-385= 2,0		1070	8,2

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) . (2)		Rotational-speed (2b) limitation intermediate speed (4a)	Fuel delivery characteristics (5a) high idle speed (5b)		Starting fuel delivery (6) Idle switching point		Torque-control (5) travel Control rod travel mm	
rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 700	0,6 bar 139,0-141,0 (136,0-144,0)	1060-1070*	LDA 700	0 bar 112,5-115,5 (109,5-118,5)	100 250	290,0-340,0 11 - 15**		

Checking values in brackets

* 1 mm less control rod travel than col. 2

11.80

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D. Adjustment Test for Manifold Pressure Compensator

-2-

Test at n =

500

rev/min decreasing pressure - in bar gauge pressure
increasing

VOL 10,0 h 1

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
229 / 427 R	0,6	0,325 0,285 0	11,4 - 11,5 11,1 - 11,2 10,4 - 10,5 10,0 - 10,1

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 MB 11,4 m

1. Edition

En

PES 6 P 110 A 820 LS 433

RSV 350-750 P1/487

supersedes

company

engine

DB

OM 407 A

157 kW (213 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

(2,95-3,15)

Port closing at prestroke

3,00-3,10

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
700	13,4	16,6 - 16,8	0,4(0,8)			
	+0,1					
350	6,6-6,8	1,1 - 1,7	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever 1	Control rod travel mm 2	Control rod travel mm rev/min 3	4	5	6	Control-lever deflection in degrees 7	rev/min 8	Control rod travel mm 9	rev/min 10	Control rod travel mm 11
loose	800= 0,3 - 1,0									
ca. 35	750-755=12,5 785-795= 4,0 850-0,3= 1,7									

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limit		③a Fuel delivery characteristics		Starting fuel delivery ⑤		④a Idle stop	
Test oil temp 40°C (104 °F)		Note changed to) rev/min				Idle			
rev/min 1	cm ³ /1000 strokes 2	3	rev/min 4	cm ³ /1000 strokes 5		rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
700	166,0-168,0 (163,0-171,0)	750-755*				100	130,0-150,0		

Checking values in brackets

* 1 mm less control rod travel than col 2

7.81

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Testoil-ISO 4113

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/ MB 11,4i2

1. Edition

En

PES 6 P 120 A 820 LS 3077 RQV 300-1100 PA 601

supersedes -

company: Daimler-Benz

engine: OM 407 A

206 kW(280PS)

Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Cyl.6

Port closing at prestroke (3,95-4,15) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	12,0±0,1	18,5 - 18,7	0,5(0,9)			
300	5,0-5,2	1,2 - 2,0	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1100 1350	15,2-17,8 0 - 1,0	-	-	-	ca. 11	100 300	min. 6,5	300 500 800	1,7-1,8 3,2-3,5 4,6-5,0
ca. 63	11,0 4,0	1140-1150 1190-1220				340-440			1100	7,1

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery Idle switching point ⑥		Torque-control ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 1100	0,7 bar 185,0-187,0 (182,0-190,0)	1140-1150*	LDA 600	0,7 bar 187,0-193,0 (184,0-196,0)	100	155,0-175,0		
			LDA 500	0 bar 144,0-146,0 (141,0-149,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

-2-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

MB 11,4 i 2

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
..LS 3077 / ..PA 601	0,7	0,42 0,30 0	12,4 - 12,6 12,2 - 12,3 11,3 - 11,4 10,7 - 10,8

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps ① and Governors

VDT-WPP 001/4

2. Edition

En

PES 8 P 100 A 921/5 RS 286
(920/5)

RQV 300-1300 PA 304 KR
.. 305, 308, 309..

supersedes

company:

engine:

1 - 8 - 4 - 2 - 7 - 3 - 6 - 5 je 45°

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8 + 0,1 mm (from BDC) (+0,15
-0,05)

Testoil-ISO 4113

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	11,4 - 12,0	0,4			
600	15	16,2 - 17,8				
200	6	2,9 - 3,9				

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

RQV..304KR

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca .66	1320 1400 1500 1640	15,0-17,6 9,5-13,8 1,8- 8,4 0	-	-	-	ca .10	120 250 400 540 680	6,9-8,0 5,2-7,4 2,2-3,8 0,2-1,6 0	250 500 800 1320 1520- 1640	0,4-1,4 2,8-3,4 4,4-4,8 8,2 End (11)

Torque control travel a = mm --- see C, 8

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ④a	Fuel delivery characteristics ⑤a high idle speed ⑤b		Starting fuel delivery Idle switching point ⑥		Torque-control ⑤ travel Control rod travel mm	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	mm 9
LDA 1300	0,85 bar 78,5-80,5	1340-1350*	LDA 900	0,85 bar 96,5-100,5	100 300	190 - 230 8 - 11	1300 900	10,0 10,4
			LDA 800	0 bar 53,0-59,0	Change-over point 170-240 min ⁻¹			

Checking values in brackets

* 1 mm less control rod travel than col. 2
6.75

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B. Governor Settings

RQV...305 KR

Ppe 286

-2-

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca .66	1320 1400 1500 1640	15,0-17,6 9,5-13,8 1,8- 8,4 0	-	-	-	ca .10	120 250 400 540 680	6,9-8,0 5,2-7,4 2,2-3,8 0,2-1,6 0	250 500 800 1320	0,4-1,4 2,8-3,4 4,4-4,8 8,2

Torque control travel a = mm

see C, 8

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA 1300	0,9 bar 74,0-76,0 (72,0-78,0)	1340-1350*	LDA 850	0,9 bar 107,0-111,0 (105,0-113,0)	100 300	190-230 8-11	1300 850	9,4 11,0
			LDA 800	0 bar 54,5 - 60,5	Change-over point 170-240 min ⁻¹			

Checking values in brackets

* 1 mm less control rod travel than col 2

B. Governor Settings

RQV...308 KR

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca .66	1320 1400 1500 1640	15,0-17,6 9,5-13,8 1,8- 8,4 0	-	-	-	ca .10	120 250 400 540 680	6,9-8,0 5,2-7,4 2,2-2,8 0,2-1,6 0	250 500 800 1320	0,4-1,4 2,8-3,4 4,4-4,8 8,2

Torque control travel a = mm

See C, 8

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA 1300	0,9 bar 109,0-111,0 (111,0-113,0)	1340-1350*	LDA 900	0,9 bar 110,5-114,5 (109,5-116,5)	100 300	190 - 230 8 - 11	1300 900	12,1 11,4
			LDA 800	0 bar 54,0-60,0	Change-over point 170-240 min ⁻¹			

Checking values in brackets

* 1 mm less control rod travel than col 2

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 66	1320 1400 1300 1640	15,0-17,6 9,5-13,8 1,8- 8,4 0	-	-	-	ca. 10	120 250 400 540 680	6,9-8,0 5,2-7,4 2,2-3,8 0,2-1,6 0	250 500 800 1320	0,4-1,4 2,8-3,4 4,4-4,8 8,2
						3a				

Torque control travel a = mm

Sect. C, col. 8!

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F) (2)		Rotational-speed limitation intermediate speed (2b) (4a)	Fuel delivery characteristics high idle speed (5a) (5b)	Starting fuel delivery idle switching point (6)	Torque-control travel (5)			
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 1300	0,85 bar 93,0-95,0 (95,0-97,0)	1340-1350*	LDA 900 LDA 800	0,85 bar 106,5-110,5 (104,0-112,5) 0 bar 80,5- 86,5	100 300 Change-over point 170-240 min ⁻¹	190-230 8- 11	1300 900	11,1 11,3

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

Test at n = **800** rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm
286 / 304 KR	0,07-0,13	0,46-0,54	+0,1 / - 0,1
286 / 305 KR	0,18-0,23	0,57-0,65	+0,1 / - 0,1
286 / 308 KR	0,11-0,16	0,68-0,75	+0,1 / - 0,1
286 / 309 KR	0,18-0,24	0,49-0,57	+0,1 / - 0,1

En

The respective control-rod travel for induction and with charge-air pressure must be read off in accordance with Section C for LDA (manifold-pressure compensator) adjustment test, paragraph D!

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 DAF 11,6 d

5. Edition

En

PE 6 P 110 A 320 RS240

RQV 200-1100 PA197R

RQ 200/1100 PS196R

RQ 250/1100 PA196R

supersedes 2.75

company: DAF

engine: DKB 1160

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke

2,8 + 0,1

mm (from BDC)

(+0,15)
(-0,05)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	13,2-13,9	0,5			
600	9	6,4- 7,6				
	12	13,2-14,7				
	15	19,0-20,9				
200	9	4,8- 6,0				

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

B. Governor Settings

RQV.. 197R

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1100 1150 1200 1240 1320	14,8-17,8 10,2-14,2 5,7-10,4 0 - 7,2 0	-	-	-	ca. 12	100 200 300 500 700	6,3-8,0 4,4-6,8 3,3-4,8 1,7-3,1 0		
						3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery Idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 850	0,7 bar 136,0-139,0 (134,0-141,0)	1120	LDA 600	0 bar 115,5-118,5 (113,5-120,5)	100 200	260-280 29 - 37		

Checking values in brackets

* 1 mm less control rod travel than col. 2

B. Governor Settings

RQ 200/1100 PA196R

DAF 11,6d

-2-

Checking of slider PRG check ①		Full-load speed regulation ④				Idle speed regulation ⑤				Torque control ③	
rev/min 1	Control rod travel mm 2	Setting point rev/min 3	Control rod travel mm 4	Control rod travel mm 5	Test specifications rev/min 6	Setting point rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
500	15,7-16,3	500	16,0	1120 1150 1180 1230	15,5-16,0 8,5-14,0 0 - 9,3 0 - 1	440	0	100 200 300 340	6,6-8,1 4,2-6,3 0 - 2,1 0	-	-

Torque-control travel on flyweight assembly dimension a =

mm

Speed regulation At

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	Control rod travel cm ³ /1000 strokes / mm 7
*	See page 1!					

Checking values in brackets

B. Governor Settings

RQ 250/111B PA196R

Checking of slider PRG check ①		Full-load speed regulation ④				Idle speed regulation ⑤				Torque control ③	
rev/min 1	Control rod travel mm 2	Setting point rev/min 3	Control rod travel mm 4	Control rod travel mm 5	Test specifications rev/min 6	Setting point rev/min 7	Control rod travel mm 8	rev/min 9	Control rod travel mm 10	rev/min 11	Control rod travel mm 12
660	15,7-16,3	660	16,0	1120 1160 1220 1280	15,6-16,0 9,0-14,0 0 - 7,0 0	670	0	150 300 450 570	6,5-8,1 4,8-6,8 1,2-3,7 0	-	-

Torque-control travel on flyweight assembly dimension a =

mm

Speed regulation At

1 mm less control rod travel

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery on governor control lever Test oil temp 40°C (104°F) ②		Control rod stop ③a	Fuel delivery characteristics ③b		Starting fuel delivery Idle speed ⑥	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	Control rod travel cm ³ /1000 strokes / mm 7
*						

En Checking values in brackets

Testoil-ISO 4113

D. Adjustment Test for Manifold Pressure Compensator

DAL11,6d -3-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
240 / 196R 240 / 197R	0,29-0,31		-0,1

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps ① and Governors

VDT-WPP 001/4

1. Edition

En

PES 8 P 100 A 921/5 RS 286 RQV 30--1300 PA 263 K
(920/5) 264,265,266

supersedes

company: I H C - U S A

engine: DVT 800

1 - 8 - 4 - 2 - 7 - 3 - 6 - 5 je 45°

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,8+0,1 mm (from BDC) (+0,15
-0,05)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	11,4 - 12,0	0,4			
600	15	16,2 - 17,8				
200	6	2,9 - 3,9				

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

B. Governor Settings

RQV .. 263, 264,265,266 KR

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 66	1310 1400 1500 1650	15,0-17,6 9,2-13,3 1,7- 8,1 0	-	-	-	ca. 10	100 250 350 500 630	6,8-8,0 4,6-6,8 3,0-4,8 1,4-2,7 0	300 500 800 1310 1520- 1640	1,1-2,1 2,2-2,8 4,6-5,0 8,2 End (11)

Torque control travel a = mm --- see C, 8

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
See page 2!								

Checking values in brackets

* 1 mm less control rod travel than col. 2

12.75

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C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational-speed limitation	Fuel delivery characteristics		Starting fuel delivery Idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

286 / 263KR:

LDA	0,85 bar	1340-1350*	LDA	0,85 bar	100	190 - 230	1300	10,5
1300	86,5-88,5		900	95,5-99,5	300	8 - 11	900	10,3
			400	67,5-71,5				
			LDA	0 bar	**		400	9,2
			400	40,5-46,5	170-240 U/min			

286 / 264KR:

LDA	0,85 bar	1340-1350*	LDA	0,85 bar	100	190 - 230	1300	9,4
1300	75,0-77,0		900	91,0-95,0	300	8 - 11	900	10,0
			700	76,0-80,0				
			LDA	0 bar	**		700	9,4
			400	35,0-41,0	170-240 U/min			

286 / 265KR:

LDA	0,85 bar	1340-1350*	LDA	0,85 bar	100	190 - 230	1300	9,0
1300	71,0-73,0		800	103,0-107,0	300	8 - 11	800	10,8
			600	81,5-85,5				
			LDA	0 bar	**		600	10,1
			400	38,5-44,5	170-240 U/min			

286 / 266KR:

LDA	0,85 bar	1340-1350*	LDA	0,85 bar	100	190 - 230	1300	11,1
1300	93,5-95,5		900	96,5-100,5	300	8 - 11	900	10,4
			700	81,5- 85,5				
			LDA	0 bar	**		700	9,8
			400	35,0-41,0	170-240 U/min			

LDA (manifold-pressure compensator) adjustment - Section D) -
Page 3!

(increase by $\pm 1,0 \text{ cm}^3$!)

**
Change-over point

Checking values in brackets

* 1 mm less control rod travel than col 2

Testoil-ISO 4113

En

KAS

K15

Pe 286 / Regler 263 .. 268 KR -3-
D. Adjustment Test for Manifold Pressure Compensator

Test at n = rev/min decreasing pressure - in bar gauge pressure
 increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)	
			Induction control-rod travel	Boost control-rod travel
286 / 263KR	0,04 - 0,10	0,35 - 0,46	+ 0,1	/ - 0,1
286 / 264KR	0,04 - 0,10	0,35 - 0,46	+ 0,1	/ - 0,1
286 / 265KR	0,04 - 0,10	0,37 - 0,48	+ 0,1	/ - 0,1
286 / 266KR	0,04 - 0,10	0,35 - 0,46	+ 0,1	/ - 0,1

Notes: 500 0
 (1) when n = 500 rev/min and gauge pressure = 0,85 bar (- maximum full-load control rod travel)

The respective control-rod travel for induction and with charge-air pressure must be read off in accordance with Section C for LDA (manifold-pressure compensator) adjustment test, paragraph D!

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps (1A) and Governors

40

WPP 001/4 MWM 33,2 e
3. Edition

En

PE 8 P 130 ..LS3010,3015

EP/RSUV..332;333,338,339

supersedes 7.77

company MWM, Süd Bremen

PE 6 P 130 ..RS3011,3023,3031

engine TBD 601.. K

..LS3026 Complete type designations and instructions page 4!

TBD 602.. K

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 2,80-2,90
(2,75-2,85) mm (from BDC)

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
800	12	33,9 - 34,7	1,4			
600	6 15	10,5 - 11,9 42,7 - 45,4				
200	6	5,1 - 6,3				

Adjust the fuel delivery from each outlet according to the values in

B. Governor Settings

300 - 750

1 Upper rated speed rev/min			Intermediate rated speed			4 Lower rated speed			3 Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 68	750 775 800	16,0 11,5 6,0	without auxiliary spring			ca. 31	300	8,0	730	0
	780 820 980	9,5-11,5 3,0- 5,0 0,3- 1,0					50 300 350 420	19 - 21 7,7-8,3 2,7-5,1 0 - 1	330	1,2-1,8
2a			with auxiliary spring							

The numbers denote the sequence of the tests

C. Settings for Fuel Injection Pump with Fitted Governor

2b Full-load stop		6 Rotational-speed limit		3a Fuel delivery characteristics		Starting fuel delivery 5		4a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to) rev/min				Idle			
rev/min	cm ³ /1000 strokes			rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9
See page 3		760							./.

Checking values in brackets

* 1 mm less control rod travel than col 2

10/78

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Testoil-ISO 4113

K17

B. Governor Settings

300 - 900

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
ca. 67	900	16,0	without auxiliary spring			ca. 27	300	8,0	880	0
	930	9,8					50	19 - 21		
	950	5,8	with auxiliary spring				300	7,7-8,3	330	1,2-1,8
②a	930	8,5-11,6					350	2,6-5,0		
	960	3,0- 5,8					440	0 - 1		
	1040	0,3- 1,0								

Testoil-ISO 4113

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery ⑤		④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)				Idle			
rev/min	cm³/1000 strokes	rev/min		rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9
See page 3		910							

Checking values in brackets

* 1 mm less control rod travel than col. 2

B. Governor Settings

① Upper rated speed rev/min			Intermediate rated speed			④ Lower rated speed			③ Torque control	
Degree of deflection of control lever	Control rod travel mm	Control rod travel mm rev/min				Control-lever deflection in degrees	rev/min	Control rod travel mm	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9	10	11
②a										

C. Settings for Fuel Injection Pump with Fitted Governor

②b Full-load stop		⑥ Rotational-speed limitat.		③a Fuel delivery characteristics		Starting fuel delivery ⑤		④a Idle stop	
Test oil temp. 40°C (104°F)		Note: changed to ...)				Idle			
rev/min	cm³/1000 strokes	rev/min		rev/min	cm³/1000 strokes	rev/min	cm³/1000 strokes	rev/min	Control rod travel mm
1	2	3		4	5	6	7	8	9

Checking values in brackets

* 1 mm less control rod travel than col. 2

C. Settings for Fuel Injection Pump with Fitted Governor

engine power Full-load delivery Control-rod stop Test oil temp. 50°C (104°F)		Rotational-speed limitation	Fuel delivery characteristics		Starting fuel delivery idle switching point		Intermediate rotational speed Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	mm
1	2	3	4	5	6	7	8	

TBD 601 - 6K Cyl.6 - Power output at speed

179 kW/243 PS / 1000/min.

500 277,0 - 279,0 510

240 kW/326 PS / 1000/min.

500 343,0 - 345,0 510

262 kW/356 PS / 1000/min.

500 388,0 - 390,0 510

215 kW/292 PS / 1200/min.

600 269,0 - 271,0 610

287 kW/390 PS / 1200/min.

600 357,0 - 359,0 610

312 kW/424 PS / 1200/min.

600 371,0 - 373,0 610

268 kW/364 PS / 1500/min.

750 259,0 - 261,0 760

356 kW/484 PS / 1500/min.

750 407,0 - 409,0 760

388 kW/527 PS / 1500/min.

750 435,0-437,0 760

420 kW/571 PS / 1800/min.

900 281,0-283,0 910

427 kW/580 PS / 1800/min.

900 378,0-380,0 910

468 kW/636 PS / 1800/min.

900 434,0-436,0 910

Checking values in brackets

Testoil-ISO 4113

* 1 mm less control rod travel than col 2

INSTRUCTIONS1. Complete type designations and engine designations

PE 6 P 130 A 320 RS3011	EP/RSUV 300-900 P10 A339/1R	TBD 601/6K
PE 6 P 130 A 320 RS3031	EP/RSUV 300-750 P 9 A333/1R	TBD 601/6K
PE 6 P 130 A 300 RS3023	- - -	TBD 601/6K
PE 6 P 130 A 320 LS3025 (300)	EP/RSUV 300-750 P 9 A332/1R, 300-900 P10 A338/1R)	TBD 602 V12K
PE 6 P 130 A 300 LS3026	- - -	
PE 8 P 130 A 500/5LS3010	- - -	
PE 8 P 130 A 500/5LS3015	- - -) TBD 602 V16K

2. Test details

Test equipment according to W 400/305 En: T-nozzles and tubing 8 x 2 x 1000 with delivery-valve holder on pump M 16 x 1.5

Basic governor setting: vertical position = 35° control lever deflection.

3. Cam sequence and angular cam spacing

PE 5 P.. 3011, 3023, 3031:

1 - 5 - 3 - 6 - 2 - 4

0 -60 -120-180-240-300° (normal)

PE 6 P.. 3025:

1 - 6 - 2 - 4 - 3 - 5

0 -15 -120-135-240-255°

PE 6 PE.. 3026:

1 - 5 - 3 - 4 - 2 - 6

0 -15 -120-135-240-255°

PE 8 P.. 3010:

1 - 6 - 8/2 - 4 - 7 - 3 - 5

0 -45 -90 -135-180-225-315°

PE 8 P..3015:

1 - 6 - 2 - 8 - 4 - 7 - 3/5

0 - 45-90 -180-225-270-315°

①

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 VOL 10,0 g

40

4. Edition

En

PE 6 P 110 A 320 RS229, Z RQV 200-1100 PA 60/2 R
RS229 200-1100 PA230/2 R
RS229, Z 250-1100 PA232/2 R

supersedes 4.81
company: Voivo
engine: THD 100 D

Port-closing test with/without ROBO diaphragm

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (2,55-2,75) mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	15,3 - 15,9				2,5 ± 0,1** (max. 2,2-2,9)
600	9	8,8 - 10,2				
	12	14,6 - 16,0				
	15	20,5 - 22,8				
200	9	6,1 - 7,5				

Adjust the fuel delivery from each outlet according to the values in

** In the case of greater dispersion alter the delivery-valve spring pre-tension accordingly

B. Governor Settings

229 mit 60/2 R

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 68	1150	15,5-18,3				ca. 23	100	7,0-10,0	1100	7,8
	1410	0					200	5,0- 8,4		
ca. 66	1100	15,0-18,0					300	2,4- 5,2		
	1200	7,2-12,6					400	0 - 2,2		
	1260	2,0- 9,0					460	0		
	1400	0				3a				

Torque control travel a = mm
abnorm. slidg-sleeve pos'n = 36,0 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA 700	0,6 bar 139,0-141,0 (138,0-142,0)	1160-1170*	LDA 700	0 bar 112,5-115,5 (111,5-116,5)	100 200	ca. 290 14 - 20 dispersion max. 3		./.

Checking values in brackets

* 1 mm less control rod travel than col. 2
3.82

Testoil-ISO 4113

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K21

K21

B. Governor Settings

229 / 230/2R

VOL 10,0 g

-2-

①

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 68	1150	15,5-18,3				ca. 23	100	7,0-10,0	1100	7,8
	1410	0					200	5,0- 8,4		
ca. 66	1100	15,0-18,0					300	2,4- 5,2		
	1200	7,2-12,5					400	0 - 2,2		
	1260	2,0- 9,0					460	0		
	1400	0				③a				

Torque control travel a = mm.
abnorm. sldg-sleeve pos'n = 36,0 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA	0,6 bar		LDA	0 bar				
700	121,0-123,0	1160-1170*	700	112,5-115,5	100	ca. 290		
					200	14 - 20)**		
						dispersion max. 3)		

* Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

B. Governor Settings

229 / 232/2R

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min Control rod travel mm	Control rod travel mm rev/min	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 50	1170	15,0-18,3				ca. 13	100	8,9-11,0	1170	8,3
	1400	0					200	7,2- 9,9		
ca. 45	1100	15,1-17,9					300	4,0- 6,9		
	1180	8,2-13,3					380	0 - 3,4		
	1260	0 - 7,8					490	0		
	1360	0				③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed		Starting fuel delivery idle switching point		Torque-control travel	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min	Control rod travel mm
1	2	3	4	5	6	7	8	9
LDA	0,6 bar		LDA	0 bar				
700	139,0-141,0	1150-1170*	700	112,5-115,5	100	ca. 290		
					250	14 - 20)**		
						dispersion max. 3)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

B. Governor Settings

229Z / 232/2R

VOL 10,0 g

-3-

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca .50	1170 1400 1100 1180 1280 1360	15,0-18,3 0 15,1-17,9 8,2-13,3 0 - 7,8 0				ca .13	100 200 300 380 490	8,9-11,0 7,2- 9,9 4,0- 6,9 0 - 3,4 0	1170	8,3
						(3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed	Starting fuel delivery idle switching point	Torque-control travel
rev/min	cm ³ /1000 strokes	rev/min	rev/min	rev/min	rev/min
1	2	3	4	6	8
LDA 700	0,7 bar 148,5-150,5	1140-1150*	LDA 700	100 250 dispersion max. 2,5	320,0-360,0 11,0- 11,0**

Checking values in brackets

* 1 mm less control rod travel than col. 2

B. Governor Settings

229Z mit 60/2R

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	Degree of deflection of control lever	rev/min	Control rod travel mm	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca .68	1150 1410	15,5-18,3 0				ca .23	100 200 300 400 460	7,0-10,0 5,0- 8,4 2,4- 5,2 0 - 2,2 0	1100	7,8
ca .66	1100 1200 1260 1400	15,0-18,0 7,2-12,6 2,0- 9,0 0				(3a)				

Torque control travel a = mm
abnorm. sldg-sleeve pos'n = 36,0 mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics high idle speed	Starting fuel delivery idle switching point	Torque-control travel
rev/min	cm ³ /1000 strokes	rev/min	rev/min	rev/min	rev/min
1	2	3	4	6	8
LDA 700	0,4 bar 121,0-123,0	1160-1170*	LDA 700	100 200 dispersion max.3	ca.290 14,0-20,0**

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

D. Adjustment Test for Manifold Pressure Compensator

VOL 10,0 g -4-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
229 / 60/2R 229 / 232/2R	0,31-0,37	0,20-0,23	- - -
229 / 230/2R	0,23-0,27	0,20-0,23	- - -
229Z / 60/2R	0,22-0,24	0,16-0,21	- - -
229Z / 232/2R	0,48-0,52	0,29-0,32	- - -

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Testoil-ISO 4113

En

K24

A27

①

Test Specifications Fuel Injection Pumps ① and Governors

40

WPP 001/4 Vol 10,0 h

4. Edition

En

PE 6 P 110 A 320 RS 229 RQV 250-1100 PA 402/2 R
RS 229 RQV 250-1100 PA 427/2 R

supersedes 1.79
company: Volvo
engine: THD 100 TD
155 kW (210PS)

** In the case of greater dispersion alter the delivery-valve spring pre-tension accordingly.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke (2,55-2,75) mm (from BDC)
2,60-2,70

Rotational speed rev/min	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Difference cm ³ /100 strokes	Control rod travel mm	Fuel delivery cm ³ /100 strokes	Spring pre-tensioning (torque-control valve) mm
1	2	3	4	2	3	6
700	10,2	12,1 - 12,3	0,4(0,8)			2,5± 0,1** (max. 2,2-2,9)
250	+0,1 5,8-5,9	0,9 - 1,3	0,3(0,7)			
700	- - -	C, col. 4-5	0,6(1,0)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	Degree of deflection of control lever	rev/min	Control rod travel	rev/min	mm
1	2	3	4	5	6	7	8	9	10	11
ca. 68	1100 1400	15,2-17,8 0 - 1				ca. 17	100 250 325-285= 2,0 500	min. 8,6 5,8-5,9 0 - 1	250 1170	0,4-1,2 8,3
ca. 51	9,2 4,0	1160-1170 1220-1250				3a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp 40°C (104°F)		Rotational-speed limitation intermediate speed	Fuel delivery characteristics		Starting fuel delivery idle switching point	Torque-control	
rev/min	cm ³ /1000 strokes	rev/min	rev/min	cm ³ /1000 strokes	rev/min	cm ³ /1000 strokes	rev/min
1	2	3	4	5	6	7	8
LDA 700	0,45 bar 121,0-123,0 (118,0-126,0)	1160-1170	LDA 700	0 bar 112,5-115,5 (109,5-118,5)	100 250	290 - 340 11 - 16** dispersion max. 3	
							9

Checking values in brackets

* 1 mm less control rod travel than col. 2

8.80

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Testoil-ISO 4113

L1

L 4

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure increasing

VOL 10,0 h

-2-

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
229 / 402/2 R 427/2 R	0,25	0,23	10,1 - 10,2 9,9 - 10,0

Notes.

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Testoil-ISO 4113

En

L2

L2

①

Test Specifications Fuel Injection Pumps ① and Governors

40

WPP 001/4 MB 19,1 m

1. Edition

En

PE 12 P 110 A 320 LS 832 RQV 350-1150 PA 510

supersedes

company:

engine:

Daimler-Benz
OM 404 A

12 - 1 - 5 - 9 - 8 - 3 - 4 - 11 - 10 - 2 - 6 - 7

0 - 45-80 -105-120-165-180-225-240-285-300-345 $\pm 0,5^\circ (\pm 0,75^\circ)$

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $3,2-3,3$ mm (from BDC) | Port closing mark cyl. 12
(3,15-3,35)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1130	13,4+0,1	15,1 - 15,3	0,4(0,8)			
350	7,0- 7,2	1,1 - 1,7	0,4(0,7)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1150 18,4 4,0 1450	15,2-17,8 1185-1195 1295-1325 0 - 1,0	-	-	-	ca. 20	100 350 610-670=2,0	min. 8,6 7,0-7,2 2,0	300 600 900 1150	0,4-1,1 3,6-3,9 5,4-5,6 7,8

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery Idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA* 1130	0,7 bar 131,0-133,0 (148,0-156,0)	1185-1195*	LDA* 450	0 bar 114,0-116,0 (111,0-119,0)	100 350	120,0-140,0 13,0- 19,0		

Checking values in brackets

* 1 mm less control rod travel than col. 2

3.81

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Testoil-ISO 4113

D. Adjustment Test for Manifold Pressure Compensator

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

MB 19,1 m

-2-

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
"S"832/..PA 510	0,7 bar	0,35 bar 0,25 bar 0 bar	13,4 - 13,5 13,1 - 13,2 12,6 - 12,8 12,3 - 12,4

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Testoil-ISO 4113

En

24

L4

①

Test Specifications Fuel Injection Pumps ① and Governors

40

WPP 001/4 STE 10,0 d

1. Edition

En

PE 6 P 110 A 320 RS 157 RQV 250-550/1100 PA 140R

supersedes -

company: Steyr

engine: (vorm. Östr.Saurer)

7 FA

235 kW (320 PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

(1,95-2,15)

RW 10,5

Port closing at prestroke

2,00-2,10

mm (from BDC)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1000	12	17,5-18,1	0,6			
600	6 12	2,2 - 3,2 16,1 -17,3				
200	6	0,4 - 1,4				

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

250-550/1100

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 66	1100 1150 1200 1300	12,0-15,0 6,8-11,2 0,4- 7,0 0 - 1	ca. 48	320 580 620 670	10,7-11,7 4,5-11,6 0 - 6 0	ca. 10	200 300 400 330	6,3-8,0 4,5-8,8 1,8-4,4 0	300 700-1000 1100	0,6-1,6 8,4-8,6 8,5

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed ②b limitation intermediate speed ④a	Fuel delivery characteristics ⑤a high idle speed ⑤b		Starting fuel delivery ⑥ idle switching point		Torque-control ⑤ travel Control rod travel mm	
rev/min 1	cm³/1000 strokes 2	rev/min 3	rev/min 4	cm³/1000 strokes 5	rev/min 6	cm³/1000 strokes 7	rev/min 8	
LDA 1100	0,7 bar 177,0-179,0 (174,0-182,0)	1180	LDA 1100	0 bar 133,0-137,0 (130,0-140,0)	100	190-210		

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

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5.81

L5

D. Adjustment Test for Manifold Pressure Compensator

-2-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

STE 10,0 d

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel- diminution difference mm (1)
157 / 140 R	0,25	0,7	1,8 mm

Notes:

(1) when n = rev/min and gauge pressure = bar (= maximum full-load control rod travel)

Testoil-ISO 4113

①

Test Specifications Fuel Injection Pumps ① and Governors

40

WPP 001/4 MB 8,7p

1. Edition

En

PES 6 MW 100/720 RS 1101 RQV 300-1300 MW 44

0 403 446 134

1 - 5 - 3 - 6 - 2 - 4

0 -60 -120-180-240-300

supersedes -

company: DB

engine: OM 362 LA

141 kW(192PS)

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke 3,20-3,30 mm (from BDC) RW 9,0-12,0 mm
(3,15-3,25)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ / 100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1300	11,9+0,1	9,45-9,65	0,35(0,6)			
300	6,0-6,1	1,05-1,45	0,35(0,55)			
800	11,9+0,1		0,5 (0,7)			
500	10,2+0,1		0,35(0,6)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min Control rod travel mm 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11.
max.	1330 1600	15,2-17,8 0,1- 1,0	-	-	-	ca. 11	300 100	6,0-6,1 min. 7,6		
ca. 64	10,9 4,0	1340-1350 1435-1465				3a	520-580=2,0			

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 1300	0,7 bar 94,5-96,5 (92,5-98,5)	1340-1350*	LDA 800	0,7 bar 89,5-93,5 (87,5-95,5)	100 300	min.80,0 10,5-14,5		
			LDA 500	0 bar 54,5-56,5 (52,5-58,5)	100-280 (80-250)			

Checking values in brackets

* 1 mm less control rod travel than col. 2

Testoil-ISO 4113

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D. Adjustment Test for Manifold Pressure Compensator

Test at n =

500 rev/min decreasing pressure - in bar gauge pressure
increasing

MB 8,7 p

-2-

Pump/governor	Setting	Measurement	Control rod travel - diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
RS 1101 / MW 44	0,38		11,4 - 11,5
		0,7	11,9 - 12,0
		0	10,2 - 10,3
		0,3	10,7 - 10,8

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Testoil-ISO 4113

Test Specifications Fuel Injection Pumps ① and Governors

WPP 001/4 MAN 20,9 m

1. Edition

En

Testoil-ISO 4113

PE 12 P 120 A 520 LS 836

ROV 250-1150 PA 439 R

supersedes

company: MAN

engine: D 2542 MLE
456 kW (620 PS)
 12 - 1 - 5 - 9 - 8 - 3 - 4 - 11 - 10 - 2 - 6 - 7
 0 -45 -60 -105-120-165-180-225 -240 -285-300-345

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

 Port closing at prestroke (2,95-3,15) mm (from BDC) RW 10,5 Cyl. 12
 3,00-3,10

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1150	11,3 +0,1	18,5 - 18,8	0,5(0,9)			
250	5,7-6,9	2,2 - 2,8	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in .

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min 2	Control rod travel mm rev/min 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1150 1400	15,2-17,8 0 - 1				ca. 11	100 250 485-545	min. 8,3 6,7- 6,9 =2,0		
ca. 64	10,3 4,0	1190-1200 1275-1305				③a				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ②b	Fuel delivery characteristics ⑤a		Starting fuel delivery Idle switching point ⑥		Torque-control ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 1150	0,7 bar 185,0-188,0 (182,0-191,0)	1190-1200*						
						100-170 (80-190)		

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

MAN 20,9 m -2-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

Pump/governor	Setting	Measurement	Control rod travel- diminution difference
	Gauge pressure = bar	Gauge pressure = bar	mm (1)
836 / 439 R	0,7	0,21	11,3 - 11,4 10,9 - 11,0

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

Test Specifications Fuel Injection Pumps ① and Governors

PES 6 P 120 A 820 LS 3077 RQV 300-1100 PA 605

supersedes

company: Daimler-Benz
engine: OM 407 LA
235 kW (320 PS)

Values only apply to test nozzle-and-holder assembly 1 688 901 019 and fuel-injection test tubing 1 680 750 067.

All test specifications are valid for Bosch Fuel Injection Pump Test Benches and Testers

A. Fuel Injection Pump Settings

Port closing at prestroke $4,0 - 4,1$ mm (from BDC) Cyl.6
(3,95-4,15)

Rotational speed rev/min 1	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Difference cm ³ /100 strokes 4	Control rod travel mm 2	Fuel delivery cm ³ /100 strokes 3	Spring pre-tensioning (torque-control valve) mm 6
1100	13,1+0,1	20,1 - 20,3	0,5(0,9)			
300	5,5-5,7	1,2 - 1,8	0,8(1,2)			

Adjust the fuel delivery from each outlet according to the values in .

Testoil-ISO 4113

B. Governor Settings

Upper rated speed			Intermediate rated speed			Lower rated speed			Sliding sleeve travel	
Degree of deflection of control lever 1	rev/min 2	Control rod travel mm 3	Degree of deflection of control lever 4	rev/min 5	Control rod travel mm 6	Degree of deflection of control lever 7	rev/min 8	Control rod travel mm 9	rev/min 10	mm 11
ca. 68	1100 1350	15,2-17,8 0 - 1,0	-	-	-	ca. 11	100 300	min. 6,0 4,5-4,7	300 500 800 1100	1,7-1,8 3,2-3,5 4,6-5,0 7,1
ca. 63	12,1 4,0	1140-1150 1205-1235				325-415 (3a)				

Torque control travel a = mm

C. Settings for Fuel Injection Pump with Fitted Governor

Full-load delivery Control-rod stop Test oil temp. 40°C (104°F) ②		Rotational-speed limitation intermediate speed ④a	Fuel delivery characteristics high idle speed ⑤b		Starting fuel delivery idle switching point ⑥		Torque-control travel ⑤	
rev/min 1	cm ³ /1000 strokes 2	rev/min 3	rev/min 4	cm ³ /1000 strokes 5	rev/min 6	cm ³ /1000 strokes 7	rev/min 8	Control rod travel mm 9
LDA 1100	0,75 bar 201,0-203,0 (198,0-206,0)	1140-1150*	LDA 675	0,75 bar 195,0-201,0 (192,0-204,0)	100	170,0-190,0		
			LDA 500	0 bar 148,0-150,0 (145,0-153,0)				

Checking values in brackets

* 1 mm less control rod travel than col. 2

D. Adjustment Test for Manifold Pressure Compensator

-2-

Test at n = 500 rev/min decreasing pressure - in bar gauge pressure
increasing

MB 11,4 i 1

Pump/governor	Setting Gauge pressure = bar	Measurement Gauge pressure = bar	Control rod travel - diminution difference mm (1)
..LS 3077 / ..PA 605	0,75	0,46 0,34 0	13,1 - 13,2 12,6 - 12,7 11,8 - 11,9 11,3 - 11,4

Notes:

(1) when n =

rev/min and
gauge pressure =

bar (= maximum full-load control rod travel)

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